

NIOSH

POCKET GUIDE TO
**CHEMICAL
HAZARDS**



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health

HCDC
HEALTH CARE DISINFECTION, CONTROL,
AND PREVENTION

NIOSH POCKET GUIDE TO CHEMICAL HAZARDS

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health

June 1994

For Sale by the Superintendent of Documents, U.S. Government
Printing Office, Washington, D.C. 20402

DISCLAIMER

Mention of the name of any company or product does not constitute endorsement by the National Institute for Occupational Safety and Health.

DHHS (NIOSH) Publication No. 94-116

For sale by the U.S. Government Printing Office, Superintendent of Documents, Washington, DC 20402 (stock no. 017-033-00473-1; telephone (202) 783-3238) and the National Technical Information Service, Springfield, VA 22161 (stock no. PB95-100368; telephone (703) 487-4650).

COPYING AND REPRINTING

This document is in the public domain and may be freely copied or reprinted. The *NIOSH Pocket Guide to Chemical Hazards* is now being made available through commercial vendors in electronic formats (e.g., CD-ROM and floppy diskette). The NIOSH Pocket Guide is currently available in CD-ROM and Diskette format from the following vendors:

Industrial Hygiene Services, Inc.
941 Gardenview Office Parkway
St. Louis, Missouri 63141
Telephone: 314-993-2236
Toll Free: 1-800-732-3015
Fax: 314-993-3193

Micromedex, Inc.
6200 South Syracuse Way, Suite 300
Englewood, Colorado 80111-4740
Telephone: 303-486-6400
Toll Free: 1-800-525-9083
Fax: 303-486-6464

Praxis Environmental Systems, Inc.
251 Nortontown Road
Guilford, Connecticut 06437
Telephone: 203-458-7111
Fax: 203-458-7121

iii

Please contact these vendors directly to receive more detailed information, including the price of their product. Further information about these electronic versions or about copies of this and other NIOSH documents may be obtained from the office listed below:

NIOSH Publications
Mail Stop C-13
4676 Columbia Parkway
Cincinnati, Ohio 45226-1998
Fax (513) 533-8573

For information on other occupational safety and health problems, call
1-800-35-NIOSH

PREFACE

The *NIOSH Pocket Guide to Chemical Hazards* presents information taken from the *NIOSH/OSHA Occupational Health Guidelines for Chemical Hazards*, from National Institute for Occupational Safety and Health (NIOSH) criteria documents and Current Intelligence Bulletins, and from recognized references in the fields of industrial hygiene, occupational medicine, toxicology, and analytical chemistry. The information is presented in tabular form to provide a quick, convenient source of information on general industrial hygiene and medical monitoring practices. The information in the *Pocket Guide* includes chemical structures or formulas, identification codes, synonyms, exposure limits, chemical and physical properties, incompatibilities and reactivities, measurement methods, respirator selections, signs and symptoms of exposure, and procedures for emergency treatment.

The information assembled in the original 1978 printing of the *Pocket Guide* was the result of the Standards Completion Program, a joint effort by NIOSH and the Department of Labor to develop supplemental requirements for the approximately 380 workplace environmental exposure standards adopted by the Occupational Safety and Health Administration (OSHA) in 1971.

This revision of the *Pocket Guide* includes updated sampling and analytical methods, updated Department of Transportation (DOT) identification and guide numbers, current exposure limits, revised respirator selections, and revised IDLH (immediately dangerous to life or health concentration) values.

CONTENTS

Preface	iv
Acknowledgments	vi
Introduction	vii
NIOSH Recommendations	viii
How to Use This Pocket Guide	ix
 Chemical Listing	 1
Appendix A—NIOSH Occupational Carcinogens	342
Appendix B—Thirteen OSHA-Regulated Carcinogens	343
Appendix C—Supplementary Exposure Limits	344
Appendix D—Substances with No Established RELs	352
Appendix E—Respirator Recommendations for Selected Chemicals	353
Appendix F—Miscellaneous Notes	354
Appendix G—Vacated 1989 OSHA PELs	355
 Synonym and Trade Name Index	 371
CAS Number Index	386
DOT ID Number Index	394

ACKNOWLEDGMENTS

The Division of Standards Development and Technology Transfer (DSDTT), National Institute for Occupational Safety and Health (NIOSH), had primary responsibility for the development of the *Pocket Guide*. I would like to express my appreciation to the following people within DSDTT for their assistance in preparing the *Pocket Guide*: David Case and Rolland Rogers for reformatting and computerization; Richard Niemeier, John Whalen, Ralph Zumwalde, Henry Chan, Barb Dames, Laurence Reed, and Heinz Ahlers for policy review; Susan Cairelli, Robert Mason, and Kent Hatfield for consultation on toxicology issues; David Votaw, Joann Wess, Crystal Ellison, Faye Rice, Brenda Boutin, Henryka Nagy, Clayton Doak, Sherry Medley, and Eileen Kuempel for assistance in updating and adding new information; Jack O'Gorman, Ronald Schuler, Vicki Reuss, Bea Proctor, Lucy Schoolfield, and Lawrence Foster for data acquisition; Sharon Cheesman and Joanne Hamons for word processing; Anne Hamilton, Vanessa Becks, and Ruth Grubbs for editorial review; Vivian Morgan for electronic database negotiations; Charlene Maloney for publication dissemination; Shirley Carr for assistance in typesetting and printing; and Midwest Publications Consultants (Sherri Diana, Gary Litfin, Rob Schattauer, and Carla Brooks) for answering requests and mailing thousands of copies of the *Pocket Guide*.

In addition, the following people from other Divisions in NIOSH also contributed greatly to the *Pocket Guide*: Mary Ellen Cassinelli, Donald Dollberg, and Peter Eller from the Division of Physical Sciences and Engineering (DPSE) for the development of the measurement methods section; Shiro Tanaka from the Division of Surveillance, Hazard Evaluations, and Field Studies for medical terminology; and Donald Campbell, Chris Coffey, John Dower, and Barry Pallay from the Division of Safety Research (DSR) for the development of the respirator recommendations.

Also, thanks are due to those individuals who reviewed and constructively commented on the *Pocket Guide* during its initial development and subsequent revisions.

Howard Ludwig (Technical Editor)

INTRODUCTION

The *NIOSH Pocket Guide to Chemical Hazards* is intended as a source of general industrial hygiene information for workers, employers, and occupational health professionals. The *Pocket Guide* presents key information and data in abbreviated tabular form for 677 chemicals or substance groupings (e.g., manganese compounds, tellurium compounds, inorganic tin compounds, etc.) that are found in the work environment. The industrial hygiene information found in the *Pocket Guide* should help users recognize and control occupational chemical hazards. The chemicals or substances contained in this revision include all substances for which the National Institute for Occupational Safety and Health (NIOSH) has recommended exposure limits (RELs) and those with permissible exposure limits (PELs) as found in the Occupational Safety and Health Administration (OSHA) General Industry Air Contaminants Standard (29 CFR 1910.1000).

Background

In 1974, NIOSH (which is responsible for recommending health and safety standards) joined OSHA (whose jurisdictions include promulgation and enforcement activities) in developing

a series of occupational health standards for substances with existing PELs. This joint effort was labeled the Standards Completion Program and involved the cooperative efforts of several contractors and personnel from various divisions within NIOSH and OSHA. The Standards Completion Program developed 380 substance-specific draft standards with supporting documentation that contained technical information and recommendations needed for the promulgation of new occupational health regulations. The *Pocket Guide* was developed to make the technical information in those draft standards more conveniently available to workers, employers, and occupational health professionals. The *Pocket Guide* is updated periodically to reflect new data regarding the toxicity of various substances and any changes in exposure standards or recommendations.

Data Collection and Application

The data collected for this revision were derived from a variety of sources, including NIOSH policy documents such as criteria documents and Current Intelligence Bulletins (CIBs), and recognized references in the fields of industrial hygiene, occupational medicine, toxicology, and analytical chemistry. New or revised data is indicated by boldface type.

NIOSH RECOMMENDATIONS

Acting under the authority of the Occupational Safety and Health Act of 1970 (29 USC Chapter 15) and the Federal Mine Safety and Health Act of 1977 (30 USC Chapter 22), NIOSH develops and periodically revises recommended exposure limits (RELs) for hazardous substances or conditions in the workplace. NIOSH also recommends appropriate preventive measures to reduce or eliminate the adverse health and safety effects of these hazards. To formulate these recommendations, NIOSH evaluates all known and available medical, biological, engineering, chemical, trade, and other information relevant to the hazard. These recommendations are then published and transmitted to OSHA and the Mine Safety and Health Administration (MSHA) for use in promulgating legal standards.

NIOSH recommendations are published in a variety of documents. Criteria documents recommend workplace exposure limits and appropriate preventive measures to reduce or eliminate adverse health effects and accidental injuries.

Current Intelligence Bulletins (CIBs) are issued to disseminate new scientific information about occupational hazards. A CIB may draw attention to a formerly unrecognized hazard, re-

port new data on a known hazard, or present information on hazard control.

Alerts, Special Hazard Reviews, Occupational Hazard Assessments, and Technical Guidelines support and complement the other standards development activities of the Institute. Their purpose is to assess the safety and health problems associated with a given agent or hazard (e.g., the potential for injury or for carcinogenic, mutagenic, or teratogenic effects) and to recommend appropriate control and surveillance methods. Although these documents are not intended to supplant the more comprehensive criteria documents, they are prepared to assist OSHA and MSHA in the formulation of regulations.

In addition to these publications, NIOSH periodically presents testimony before various Congressional committees and at OSHA and MSHA rulemaking hearings.

A complete list of occupational safety and health issues for which NIOSH has formal policies (e.g., recommendations for occupational exposure to chemical and physical hazards, engineering controls, work practices, safety considerations, etc.) can be found in *NIOSH Recommendations for Occupational Safety and Health: Compendium of Policy Documents and Statements* [DHHS (NIOSH) Publication No. 92-100].

HOW TO USE THIS POCKET GUIDE

The *Pocket Guide* has been designed to provide chemical-specific data to supplement general industrial hygiene knowledge. To maximize the amount of data provided in this limited space, abbreviations and codes have been used extensively. These abbreviations and codes, which have been designed to permit rapid comprehension by the regular user, are discussed for each column in the following subsections.

Chemical Name and Structure/Formula, CAS and RTECS Numbers, and DOT ID and Guide Numbers

Chemical Name and Structure/Formula. — The chemical name found in the OSHA General Industry Air Contaminants Standard (29 CFR* 1910.1000) is listed first. The chemical structure or formula is also provided; carbon-carbon double bonds (-C=C-) and carbon-carbon triple bonds (-C≡C-) have been indicated where applicable. A page index for selected synonyms and trade names is included at the back of the *Pocket Guide* to help the user locate a specific substance.

CAS and RTECS Numbers. — Below the chemical structure/formula is the Chemical Abstracts Service (CAS) registry number. This number, in the format xxx-xx-x, is unique for each chemical and allows efficient searching on computerized data

*Code of Federal Regulations.

bases. A page index for all CAS registry numbers listed is included at the back of the *Pocket Guide* to help the user locate a specific substance.

Immediately below the CAS number is the NIOSH Registry of Toxic Effects of Chemical Substances (RTECS) number, in the format ABxxxxxxx. RTECS may be useful for obtaining additional toxicologic information on a specific substance.

DOT ID and GUIDE Number. — Under the RTECS number are the U.S. Department of Transportation (DOT) identification number and the corresponding guide number. Their format is xxxx xx. The Identification number (xxxx) indicates that the chemical is regulated by DOT. The Guide number (xx) refers to actions to be taken to stabilize an emergency situation; this information can be found in the DOT 1990 *Emergency Response Guidebook*, DOT P 5800.5 (Office of Hazardous Materials Transportation [DHM-51], Research and Special Programs Administration, U.S. Department of Transportation, 400 Seventh Street S.W., Washington, D.C. 20590-0001). A page index for all DOT ID numbers listed is included at the back of the *Pocket Guide* to help the user locate a specific substance; please note however, that many DOT numbers are NOT unique for specific substances.

Synonyms, Trade Names, and Conversion Factors

Common synonyms and trade names are listed alphabetically for each chemical. Factors for the conversion of ppm (parts

of vapor or gas per million parts of contaminated air by volume) to mg/m³ (milligrams of vapor or gas per cubic meter of contaminated air) at 68°F and 1 atmosphere are listed for all liquids and gases, and for some solids with appreciable vapor pressures.

Exposure Limits

The NIOSH recommended exposure limits (RELs) are listed first in this column. Unless noted otherwise, RELs are time-weighted average (TWA) concentrations for up to a 10-hour workday during a 40-hour workweek. A short-term exposure limit (STEL) is designated by "ST" preceding the value; unless noted otherwise, the STEL is a 15-minute TWA exposure that should not be exceeded at any time during a workday. A ceiling REL is designated by "C" preceding the value; unless noted otherwise, the ceiling value should not be exceeded at any time. Any substance that NIOSH considers to be a potential occupational carcinogen is designated by the notation "Ca" (see Appendix A, which contains a brief discussion of potential occupational carcinogens).

The OSHA permissible exposure limits (PELs), as found in Tables Z-1, Z-2, and Z-3 of the OSHA General Industry Air Contaminants Standard (29 CFR 1910.1000), that were effective on July 1, 1993* and which are currently enforced by OSHA are listed next. [*Note: In July 1992, the 11th Circuit Court of Ap-

peals in its decision in *AFL-CIO v. OSHA*, 965 F.2d 962 (11th Cir., 1992) vacated more protective PELs set by OSHA in 1989 for 212 substances, moving them back to PELs established in 1971. The appeals court also vacated new PELs for 164 substances that were not previously regulated. Although OSHA is currently enforcing exposure limits in Tables Z-1, Z-2, and Z-3 of 29 CFR 1910.1000 which were in effect before 1989, violations of the "general duty clause" as contained in Section 5(a)(1) of the Occupational Safety and Health Act may be considered when worker exposures exceed the 1989 PELs for the 164 substances that were not previously regulated. The substances for which OSHA PELs were vacated on June 30, 1993 are indicated by the symbol "†" following OSHA in this column and previous values are listed in Appendix G.] Unless noted otherwise, PELs are TWA concentrations that must not be exceeded during any 8-hour work shift of a 40-hour workweek. A STEL is designated by "ST" preceding the value and is measured over a 15-minute period unless noted otherwise. OSHA ceiling concentrations (designated by "C" preceding the value) must not be exceeded during any part of the workday; if instantaneous monitoring is not feasible, the ceiling must be assessed as a 15-minute TWA exposure. In addition, there are a number of substances from Table Z-2 (e.g., beryllium, ethylene dibromide, and methylene chloride) that have PEL ceiling values that must not be exceeded except for a maximum peak over a specified

period (e.g., a 5-minute maximum peak in any 2 hours). Appendix B contains a brief discussion of substances regulated as carcinogens by OSHA.

Concentrations are given in ppm, mg/m³, mppcf (millions of particles per cubic foot of air as determined from counting an impinger sample), or fibers/cm³ (fibers per cubic centimeter). The "[skin]" designation indicates the potential for dermal absorption; skin exposure should be prevented as necessary through the use of good work practices and gloves, coveralls, goggles, and other appropriate equipment. The "(total)" designation indicates that the REL or PEL listed is for "total particulate" versus the "(resp)" designation which refers to the "respirable fraction" of the airborne particulate. Appendix C contains more detailed discussions of the specific exposure limits for certain low-molecular-weight aldehydes, asbestos, various dyes (benzidine-, o-tolidine-, and o-dianisidine-based), carbon black, the various chromium compounds (chromic acid and chromates, chromium(II) and chromium(III) compounds, and chromium metal), coal tar pitch volatiles, coke oven emissions, cotton dust, lead, NIA Catalyst ESN, trichloroethylene, and tungsten carbide (cemented). Appendix D contains a brief discussion of substances included in the *Pocket Guide* with no established RELs at this time and Appendix F contains miscellaneous notes regarding the OSHA PELs. Appendix G lists the OSHA PELs that were vacated on June 30, 1993.]

IDLH

For this *Pocket Guide*, immediately dangerous to life or health concentrations (IDLHs) have been reviewed and, in many cases, have been revised and made more protective. As a consequence of the IDLH changes, many of the respirator recommendations for these substances have also been revised. The criteria utilized to determine the adequacy of existing IDLH values were a combination of those used during the Standards Completion Program and a newer methodology developed by NIOSH. These "Interim" criteria form a tiered approach with acute human toxicity data being used preferentially, followed next by acute animal inhalation toxicity data, and then finally by acute animal oral toxicity data to determine an updated IDLH value. When relevant acute toxicity data were insufficient or unavailable, then the use of chronic toxicity data or an analogy to a chemically similar substance was considered. The criteria and information sources for both the original and revised IDLH values are given in *Documentation for Immediately Dangerous to Life and Health Concentrations (IDLHs)* (NTIS Publication No. PB-94-195047). NIOSH is currently assessing the various uses of IDLHs and whether the original criteria used to derive the IDLH values are valid or if other information or criteria should be utilized. Based on this assessment, NIOSH will develop a new strategy for revis-

ing the IDLH values currently listed, as well as for developing new IDLH values for the more than 300 substances listed in the *Pocket Guide* without IDLHs.

The definition of IDLH that was derived during the Standards Completion Program was based on the Mine Safety and Health Administration (MSHA) definition stipulated in 30 CFR 11.3(f). The purpose for establishing an IDLH value in the Standards Completion Program was to ensure that a worker could escape without injury or irreversible health effects from an IDLH exposure in the event of the failure of respiratory protection equipment. The IDLH was considered a maximum concentration above which only a highly reliable breathing apparatus providing maximum worker protection was permitted. In determining IDLH values, the ability of a worker to escape without loss of life or irreversible health effects was considered along with severe eye or respiratory irritation and other deleterious effects (e.g., disorientation or incoordination) that could prevent escape. As a safety margin, the Standards Completion Program IDLH values were based on the effects that might occur as a consequence of a 30-minute exposure. However, the 30-minute period was NOT meant to imply that workers should stay in the work environment any longer than necessary, in fact, **EVERY EFFORT SHOULD BE MADE TO EXIT IMMEDIATELY!**

The current NIOSH definition for an IDLH exposure condition, as stipulated in the *NIOSH Respirator Decision Logic* (DHHS

[NIOSH] Publication No. 87-108, NTIS Publication No. PB-91-151183), is a condition "that poses a threat of exposure to airborne contaminants when that exposure is likely to cause death or immediate or delayed permanent adverse health effects or prevent escape from such an environment." The purpose of establishing an IDLH exposure concentration is to "ensure that the worker can escape from a given contaminated environment in the event of failure of the respiratory protection equipment." The NIOSH Respirator Decision Logic uses these IDLH values as one of several respirator selection criteria. Under the NIOSH Respirator Decision Logic, the most protective respirators (e.g., a self-contained breathing apparatus equipped with a full facepiece and operated in a pressure-demand or other positive-pressure mode) would be selected for firefighting, exposure to carcinogens, entry into oxygen-deficient atmospheres, in emergency situations, during entry into an atmosphere that contains a substance at a concentration greater than 2,000 times the NIOSH REL or OSHA PEL, and for entry into IDLH atmospheres.

IDLH values are listed for over 380 substances. The notation "Ca" appears in this column for all substances that NIOSH considers to be potential occupational carcinogens (NIOSH recommends the most protective respirators for these substances at concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration). However, IDLH values

that were originally determined in the Standards Completion Program or were recently revised are shown in brackets following the "Ca" designations. "Unknown" indicates that because of a lack of data no IDLH could be determined. "LEL" indicates that the IDLH was based on 10% of the lower explosive limit for safety considerations even though the relevant toxicological data indicated that irreversible health effects or impairment of escape existed only at higher concentrations. "N.D." indicates that an IDLH has not as yet been determined.

Physical Description

This column provides a brief description of the appearance and odor of each substance. Notations are made as to whether a substance can be shipped as a liquefied compressed gas or whether it has major use as a pesticide.

Chemical and Physical Properties

The following abbreviations are used for the chemical and physical properties given for each substance. "NA" indicates that a property is not applicable, and a question mark (?) indicates that it is unknown.

MW	Molecular weight
BP	Boiling point at 1 atmosphere, °F
Sol	Solubility in water at 68°F*, % by weight (i.e., g/100 ml)

FI.P	Flash point (i.e., the temperature at which the liquid phase gives off enough vapor to flash when exposed to an external ignition source), closed cup (unless annotated "(oc)" for open cup), °F
IP**	Ionization potential, eV (electron volts)
VP	Vapor pressure at 68°F*, mm Hg; "approx" indicates approximately
MLT	Melting point for solids, °F
FRZ	Freezing point for liquids and gases, °F
UEL	Upper explosive (flammable) limit in air, % by volume (at room temperature*)
LEL	Lower explosive (flammable) limit in air, % by volume (at room temperature*)
MEC	Minimum explosive concentration, g/m ³ (when available)
Sp.Gr	Specific gravity at 68°F* referenced to water at 39.2°F(4°C)
RGasD	Relative density of gases referenced to air = 1 (indicates how many times a gas is heavier than air at the same temperature)

*If noted after a specific entry, these properties may be reported at other temperatures.

**Ionization potentials are given as a guideline for the selection of photoionization detector lamps used in some direct-reading instruments.

When possible, the flammability/combustibility of a substance was determined and listed after the specific gravity. The following OSHA criteria (29 CFR 1910.106) were used to classify flammable or combustible liquids:

Class IA flammable liquid	Fl.P. below 73°F and BP below 100°F.
Class IB flammable liquid	Fl.P. below 73°F and BP at or above 100°F.
Class IC flammable liquid	Fl.P. at or above 73°F and below 100°F.
Class II combustible liquid	Fl.P. at or above 100°F and below 140°F.
Class IIIA combustible liquid	Fl.P. at or above 140°F and below 200°F.
Class IIIB combustible liquid	Fl.P. at or above 200°F.

Incompatibilities and Reactivities

This column lists important hazardous incompatibilities or reactivities of each substance.

Measurement Method

This column provides a brief, key word description of the suggested sampling and analysis method. Each description

comprises four components: (1) the collection method, (2) the sample work-up, (3) the analytical method, and (4) the method number. The method number is usually from the 3rd edition of the *NIOSH Manual of Analytical Methods* (DHHS [NIOSH] Publication No. 84-100) and is indicated by "III" following the sample work-up. If the 2nd edition of the *NIOSH Manual of Analytical Methods* is cited, this fact is noted along with the appropriate volume number [e.g., II(4)]. In a number of instances, the table cites the *1990 OSHA Analytical Methods Manual* and applicable method number (e.g., OSHA [#21]). When a method for a particular substance is not included in the latest NIOSH or OSHA analytical methods manuals, "None available" is listed. The codes listed are explained in Table 1. Table 2 presents ordering information for the measurement methods cited.

Personal Protection and Sanitation

This column presents a summary of recommended practices for each toxic substance. These recommendations supplement general work practices (e.g., no eating, drinking, or smoking where chemicals are used). Table 3 explains the codes used. Each category is described as follows:

SKIN: Recommends the need for personal protective clothing.

EYES:	Recommends the need for eye protection.
WASH SKIN:	Recommends when workers should wash the spilled chemical from the body in addition to normal washing (e.g., before eating).
REMOVE:	Advises workers when to remove clothing that has accidentally become wet or significantly contaminated.
CHANGE:	Recommends whether the routine changing of clothing is needed.
PROVIDE:	Recommends the need for eyewash fountains and/or quick drench facilities.

Recommendations for Respirator Selection

This column provides a condensed table of allowable respirator use for those substances for which IDLH values have been determined. Each line lists in ppm or mg/m³ a maximum concentration for use (commonly referred to as MUC, maximum use concentration) or condition (i.e., emergency or planned entry into unknown concentrations or IDLH conditions [designated by the symbol §], or escape from suddenly occurring respiratory hazards) followed by a series of codes representing classes of respirators. Individual respirator codes are separated by diagonal marks (/). For each MUC, the table lists only those respirators with the minimum required protection factor and other

use restrictions based on the *NIOSH Respirator Decision Logic* (DHHS [NIOSH] Publication No. 87-108, NTIS Publication No. PB-91-151183). More protective respirators can be worn. All recommended respirators of a given class can be used at any concentration equal to or less than the MUC listed for that class.

The recommendations for respirator selection for each substance are based on the more restrictive occupational exposure limit found between the NIOSH REL and the current OSHA PEL.

As mentioned previously, NIOSH is assessing the adequacy of the criteria used for determining IDLH values. As IDLH values are developed, revised respirator selection recommendations will be incorporated into subsequent editions of the *Pocket Guide*. In the interim, however, no respirator recommendations will be made for substances without IDLH values (these will be noted by "TBAL" -- To Be Added Later).

All respirators selected must be approved by NIOSH and MSHA under the provisions of 30 CFR 11. The current listing of NIOSH/MSHA certified respirators can be found in the *NIOSH Certified Equipment List* (DHHS [NIOSH] Publication No. 94-104).

A complete respiratory protection program must be implemented and must fulfill all requirements of 29 CFR 1910.134. At a minimum, a respiratory protection program should include

regular training, fit-testing, periodic environmental monitoring, maintenance, inspection, cleaning, and storage. Selection of a specific respirator within a given class of recommended respirators depends on the particular situation; this choice should be made only by a knowledgeable person. **REMEMBER:** air-purifying respirators will not protect users against oxygen-deficient atmospheres, and they are not to be used in IDLH conditions. The only respirators recommended for fire fighting are self-contained breathing apparatuses that have full facepieces and are operated in a pressure-demand or other positive-pressure modes. Additional information on the selection and use of respirators can be found in the *NIOSH Respirator Decision Logic* and the *NIOSH Guide to Industrial Respiratory Protection* (DHHS [NIOSH] Publication No. 87-116).

Codes for the various categories of respirators are defined in Table 4. In addition, the assigned protection factor (APF) is indicated for each respirator class.

Route of Health Hazard

This column lists the toxicologically important routes of entry for each substance and whether contact with the skin or eyes is potentially hazardous, abbreviated as follows:

Inh Inhalation

Abs Skin absorption
 Ing Ingestion
 Con Skin and/or eye contact
 (liq) Liquid
 (sol) Solid
 (soln) Solution

Symptoms

This column lists the potential symptoms of exposure. Their abbreviations are defined in Table 5.

First Aid

This column lists emergency procedures for eye and skin contact, inhalation, and ingestion of the toxic substance. Abbreviations are defined in Table 6.

Target Organs

This column lists the organs that are affected by exposure to each substance. Abbreviations are defined in Table 5.

Table 1. — Codes for measurement methods

Code	Method/reagent	Code	Method/reagent
Collection method:*		Sample work-up	
Ambersorb	Ambersorb® XE-347 tube	CCl ₄	Carbon tetrachloride
Bag	Gas collection bag	CFC-113	1,1,2-Trichloro-1,2,2-trifluoroethane
Bub	Bubbler	CHCl ₃	Chloroform
Carbo-B	Carbosieve® B tube	CH ₂ Cl ₂	Methylene chloride
Char	Charcoal tube	CH ₃ CN	Acetonitrile
Char (low-Ni)	Charcoal tube (low nickel content)	CH ₃ COOH	Acetic acid
Char (pet)	Charcoal tube (petroleum-based)	CS ₂	Carbon disulfide
Chrom	Chromosorb tube	DCE	1,2-Dichloroethane
Dry tube	Drying tube	DMF	Dimethylformamide
Filter	Particulate filter	EDTA	Ethylenedinitrilo-tetraacetic acid
Florisil	Florisil® tube	FeCl ₃	Ferric chloride
G-chrom P	Gas-chrom P® tube	HCl	Hydrochloric acid
Hydrar	Hydrar® sorbent tube	HCOOH	Formic acid
Imp	Impinger	HNO ₃	Nitric acid
Mol-sieve	Molecular sieve tube	H ₂ O ₂	Hydrogen peroxide
Pad/Pre-filter	Treated pad with a pre-filter	HPLC	High-pressure liquid chromatography
Porapak	Porapak® tube	H ₃ PO ₄	Phosphoric acid
Si gel	Silica gel tube	H ₂ SO ₄	Sulfuric acid
Soda lime	Soda lime sorbent tube	KI	Potassium iodide
Tenax GC	Tenax® GC tube	KOH	Potassium hydroxide
T-Sorb	Thermosorb® tube	LTA	Low-temperature ashing
Vertical elut	Vertical elutriator	Na ₂ CO ₃	Sodium carbonate
XAD	XAD® tube		

(Continued)

In the chemical listing, an asterisk following an adsorbent tube code (e.g., Char, Si gel*, XAD-2*, etc.) indicates that a special coating must be added. The figure "2" in parentheses following a collection device (e.g., Filter(2), Imp(2), Char(2), etc.) indicates that two are used in series.

Table 1. — Codes for measurement methods (Continued)

Code	Method/reagent	Code	Method/reagent
NaHCO ₃	Sodium bicarbonate	GC/NPD	GC with nitrogen/phosphorus detection
NaOH	Sodium hydroxide	GC/PID	GC with photoionization detection
Na ₂ S ₂ O ₃	Sodium thiosulfate	GC/TCD	GC with thermal conductivity detector
NH ₄ OH	Ammonium hydroxide	GC/TEA	GC with thermal energy analyzer detection
Pho-acid	Phosphomolybdic acid	GC/TEA-EAP	GC/TEA with explosives package
Thermal desorp	Thermal desorption apparatus	Grav	Gravimetric
THF	Tetrahydrofuran	HGA	Flameless atomic absorption with a high-temperature graphite analyzer
Analytical method:		HPLC/AAS-GF	High-pressure liquid chromatography with graphite furnace AAS
AAS	Atomic absorption spectrometry	HPLC/FLD	High-pressure liquid chromatography with fluorescence detection
AAS/GF	Graphite furnace AAS	HPLC/UVd	High-pressure liquid chromatography with ultraviolet detection
DPCSP	Differential pulse cathodic stripping polarography	IC	Ion chromatography
ECA	Electrochemical analysis	ICP	Inductively coupled plasma
GC	Gas chromatography	IR	Infrared spectrometry
GC/AlkFID	GC with alkaline flame ionization detection	ISE	Ion-specific electrode
GC/ECD	GC with electron capture detection	PCM	Phase contrast microscopy
GC/EConD	GC with electrolytic conductivity detection	PES	Plasma emission spectroscopy
GC/FID	GC with flame ionization detection		(Continued)
GC/FPD	GC with flame photometric detection for sulfur, nitrogen, or phosphorus		

Table 1. — Codes for measurement methods (Continued)

Code	Method/reagent	Code	Method/reagent
PLR	Polarography	Vis	Visible spectrophotometry
TEM	Transmission electron microscopy	XRF	X-ray fluorescence spectrometry
Titrate	Titration	XRD	X-ray diffraction spectrometry
UV-vis	Ultraviolet-visible spectrophotometry		

Table 2. — Ordering information for measurement methods

Manual	Publication No.	Ordering No.	Manual	Publication No.	Ordering No.
NIOSH Manual of Analytical Methods, 2nd edition (II):			Supplement to 3rd edition	NIOSH 85-117	PB-86-116-266
Vol. 1	NIOSH 77-157-A	PB-274-845	2nd supplement to 3rd edition	NIOSH 87-117	PB-88-204-722
Vol. 2	NIOSH 77-157-B	PB-276-624	3rd supplement to 3rd edition	NIOSH 89-127	PB-90-162-470
Vol. 3	NIOSH 77-157-C	PB-276-838	4th supplement to 3rd edition	NIOSH 90-121	PB-91-152-660
Vol. 4	NIOSH 78-175	PB-83-105-437	OSHA Analytical Methods Manual, 1990 edition	—	4542*
Vol. 5	NIOSH 79-141	PB-83-105-445	NIOSH Manual of Analytical Methods (NMAM), 4th edition	NIOSH 94-113	017-011-00007-9**
Vol. 6	NIOSH 80-125	PB-82-157-728			
Vol. 7	NIOSH 82-100	PB-83-105-452			
NIOSH Manual of Analytical Methods (NMAM), 3rd edition (III)	NIOSH 84-100	PB-85-179-018			

*Denotes ordering number of the American Conference of Governmental Industrial Hygienists (ACGIH), 1330 Kemper Meadow Drive, Cincinnati, OH 45240 (513-742-2020). All other ordering numbers are for the National Technical Information Service (NTIS), Springfield, VA 22161 (703-487-4650).

**Printed copies of the NMAM are available from the U. S. Government Printing Office, Superintendent of Documents, Washington, DC 20402.

The computerized version of the NIOSH Manual of Analytical Methods (NMAM) is available on diskette from the Canadian Centre for Occupational Health and Safety, 250 Main Street East, Toronto, Ontario CANADA M5H 1M5. Telephone 905-570-8096. Toll Free 1-800-668-4184 and Windows/Chem Software, Inc. 420-F

Table 3. — Personal protection and sanitation codes

Code	Definition	Code	Definition
SKIN		WASH SKIN	
Prevent skin contact ..	Wear appropriate personal protective clothing to prevent skin contact.	When contam	The worker should immediately wash the skin when it becomes contaminated.
Frostbite	Wear appropriate personal protective clothing to prevent the skin from becoming frozen from contact with the liquid or from contact with vessels containing the liquid.	Daily	The worker should wash daily at the end of each work shift.
N.R	No recommendation is made specifying the need for personal protective equipment for the body.	N.R	No recommendation is made specifying the need for washing the substance from the skin (either immediately or at the end of the work shift).
EYES		REMOVE	
Prevent eye contact ..	Wear appropriate eye protection to prevent eye contact.	When wet or contam ..	Work clothing that becomes wet or significantly contaminated should be removed and replaced.
Frostbite	Wear appropriate eye protection to prevent eye contact with the liquid that could result in burns or tissue damage from frostbite.	When wet (flamm)	Work clothing that becomes wet should be immediately removed due to its flammability hazard (i.e., for liquids with a flash point <100°F).
N.R	No recommendation is made specifying the need for eye protection.	N.R	No recommendation is made specifying the need for removing clothing that becomes wet or contaminated.

(Continued)

Table 3. — Personal protection and sanitation codes (Continued)

Code	Definition	Code	Definition
CHANGE			
Daily	Workers whose clothing may have become contaminated should change into uncontaminated clothing before leaving the work premises.		substance from any body areas likely to be exposed. The actual determination of what constitutes an adequate quick drench facility depends on the specific circumstances. In certain instances, a deluge shower should be readily available, whereas in others, the availability of water from a sink or hose could be considered adequate.]
N.R.	No recommendation is made specifying the need for the worker to change clothing after the workshift.		
PROVIDE		Frostbite	Quick drench facilities and/or eyewash fountains should be provided within the immediate work area for emergency use where there is any possibility of exposure to liquids that are extremely cold or rapidly evaporating.
Eyewash	Eyewash fountains should be provided in areas where there is any possibility that workers could be exposed to the substance; this is irrespective of the recommendation involving the wearing of eye protection.		
Quick drench	Facilities for quickly drenching the body should be provided within the immediate work area for emergency use where there is a possibility of exposure. [Note: It is intended that these facilities provide a sufficient quantity or flow of water to quickly remove the	OTHER CODES	
		Liq.....	Liquid
		Molt.....	Molten
		N.R.....	No recommendation applies in this category
		Sol.....	Solid
		Soln.....	Solution containing the contaminant
		Vap.....	Vapor

Table 4. — Symbols, code components, and codes used for respirator selection

Item	Definition	Item	Definition
Symbol:		PAPR ...	Powered, air-purifying respirator
¥	At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration	SA	Supplied-air respirator
§	Emergency or planned entry into unknown concentrations or IDLH conditions	SCBA ...	Self-contained breathing apparatus
*	Substance reported to cause eye irritation or damage; may require eye protection	AG	Acid gas cartridge or canister
£	Substance causes eye irritation or damage; eye protection needed	CF	Continuous flow mode
^	If not present as a fume	HiE	Air-purifying respirator with a high-efficiency particulate filter (if an independent code); or a high-efficiency particulate filter
ζ	Only nonoxidizable sorbents are allowed (not charcoal)	HiEF	Air-purifying, full-facepiece respirator with a high-efficiency particulate filter
†	End of service life indicator (ESLI) required	OV	Organic vapor cartridge or canister
APF	Assigned protection factor	PD, PP ..	Pressure-demand or other positive-pressure mode
Code component:		S	Chemical cartridge or canister providing protection against the compound of concern
CCR	Chemical cartridge respirator	T	Tight-fitting facepiece
D	Dust respirator (if an independent code); or a dust filter	XS	Except single-use respirator
F	Full facepiece	XSQ	Except single-use and quarter-mask respirator
Fu	Fume filter	Code:	
GMF	Air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister	CCRFAGHiE (APF = 50) ...	Any chemical cartridge respirator with a full facepiece and acid gas cartridge(s) in combination with a high-efficiency particulate filter
M	Mist filter		(Continued)

Table 4. — Symbols, code components, and codes used for respirator selection (Continued)

Item	Definition	Item	Definition
Code (continued)		CCROV (APF = 10)	Any chemical cartridge respirator with organic vapor cartridge(s)
CCRFOV (APF = 50)	Any chemical cartridge respirator with a full facepiece and organic vapor cartridge(s)	CCROVAG (APF = 10)	Any chemical cartridge respirator with organic vapor and acid gas cartridge(s)
CCRFOVDMFu (APF = 50)	Any chemical cartridge respirator with a full facepiece and organic vapor cartridge(s) in combination with a dust, mist, and fume filter	CCROVDM (APF = 10)	Any chemical cartridge respirator with organic vapor cartridge(s) in combination with a dust and mist filter
CCRFOVHiE (APF = 50) ...	Any chemical cartridge respirator with a full facepiece and organic vapor cartridge(s) in combination with a high-efficiency particulate filter	CCROVDMFu (APF = 10) .	Any chemical cartridge respirator with organic vapor cartridge(s) in combination with a dust, mist, and fume filter
CCRFS (APF = 50)	Any chemical cartridge respirator with a full facepiece and cartridge(s) providing protection against the compound of concern	CCROVHiE (APF = 10)	Any chemical cartridge respirator with organic vapor cartridge(s) in combination with a high-efficiency particulate filter
CCRFSHiE (APF = 50)	Any chemical cartridge respirator with a full facepiece and cartridge(s) providing protection against the compound of concern and having a high-efficiency particulate filter	CCRS (APF = 10)	Any chemical cartridge respirator with cartridge(s) providing protection against the compound of concern
		D (APF = 5)	Any dust respirator
		DM (APF = 5)	Any dust and mist respirator

(Continued)

Table 4. — Symbols, code components, and codes used for respirator selection (Continued)

Item	Definition	Item	Definition
Code (continued)			
DMF (APF = 10)	Any dust and mist respirator with a full facepiece	GMFOV (APF = 50)	Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
DMFu (APF = 10)	Any dust, mist, and fume respirator	GMFOVAG (APF = 50)	Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor and acid gas canister
DMXSQ (APF = 10)	Any dust and mist respirator except single-use and quarter-mask respirators	GMFOVAGHiE (APF = 50)	Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor and acid gas canister having a high efficiency particulate filter
DXSQ (APF = 10)	Any dust respirator except single-use and quarter-mask respirators	GMFOVDMFu (APF = 50)	Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister in combination with a dust, mist, and fume filter
GMFAG (APF = 50)	Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted acid gas canister		
GMFAGHiE (APF = 50)	Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted acid gas canister having a high-efficiency particulate filter		

(Continued)

Table 4. — Symbols, code components, and codes used for respirator selection (Continued)

Item	Definition	Item	Definition
Code (continued)		HiEF (APF = 50)	Any air-purifying, full-facepiece respirator with a high-efficiency particulate filter
GMFOVHiE (APF = 50)	Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister having a high-efficiency particulate filter	PAPRAG (APF = 25)	Any powered, air-purifying respirator with acid gas cartridge(s)
GMFS (APF = 50)	Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of concern	PAPRAGHiE (APF = 25) ...	Any powered, air-purifying respirator with acid gas cartridge(s) in combination with a high-efficiency particulate filter
GMFSHiE (APF = 50)	Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back mounted canister providing protection against the compound of concern and having a high-efficiency particulate filter	PAPRD (APF = 25)	Any powered, air-purifying respirator with a dust filter
HiE (APF = 10)	Any air-purifying respirator with a high-efficiency particulate filter	PAPRDM (APF = 25)	Any powered, air-purifying respirator with a dust and mist filter
		PAPRDMFu (APF = 25)	Any powered, air-purifying respirator with a dust, mist, and fume filter
		PAPRHiE (APF = 25)	Any powered, air-purifying respirator with a high-efficiency particulate filter
		PAPROV (APF = 25)	Any powered, air-purifying respirator with organic vapor cartridge(s)

(Continued)

Table 4. — Symbols, code components, and codes used for respirator selection (Continued)

Item	Definition	Item	Definition
Code (continued)			
PAPROVAG (APF = 25)	Any powered, air-purifying respirator with organic vapor and acid gas cartridge(s)	PAPRTOVHiE (APF = 50) .	Any powered, air-purifying respirator with a tight-fitting facepiece and organic vapor cartridge(s) in combination with a high-efficiency particulate filter
PAPROVDM (APF = 25) ...	Any powered, air-purifying respirator with organic vapor cartridge(s) in combination with a dust and mist filter	PAPRTS (APF = 50)	Any powered, air-purifying respirator with a tight-fitting facepiece and cartridge(s) providing protection against the compound of concern
PAPROVDMFu (APF = 25)	Any powered, air-purifying respirator with organic vapor cartridge(s) in combination with a dust, mist, and fume filter	SA (APF = 10)	Any supplied-air respirator
PAPRS (APF = 25)	Any powered, air-purifying respirator with cartridge(s) providing protection against the compound of concern	SA:CF (APF = 25)	Any supplied-air respirator operated in a continuous-flow mode
PAPRTHiE (APF = 50)	Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter	SAF (APF = 50)	Any supplied-air respirator with a full facepiece
PAPRTOV (APF = 50)	Any powered, air-purifying respirator with a tight-fitting facepiece and organic vapor cartridge(s)	SAF:PD,PP (APF = 2000) .	Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

(Continued)

Table 4. — Symbols, code components, and codes used for respirator selection (Continued)

Item	Definition	Item	Definition
Code (continued)		SAT:CF (APF = 50)	Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode
SAF:PD,PP:ASCBA (APF = 10,000)	Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode	SCBAE	Any appropriate escape-type, self-contained breathing apparatus
SA:PD,PP (APF = 1000) ...	Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode	SCBAF (APF = 50)	Any self-contained breathing apparatus with a full facepiece
		SCBAF:PD,PP (APF = 10,000)	Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

Table 5. — Abbreviations for symptoms of exposure and target organs

Abbreviation	Symptom/organ	Abbreviation	Symptom/organ
abdom	Abdominal	constip	Constipation
abnor	Abnormal/Abnormalities	convuls	Convulsions
album	Albuminuria	corn	Corneal
anes	Anesthesia	CVS	Cardiovascular system
anor	Anorexia	cyan	Cyanosis
anos	Anosmia (loss of the sense of smell)	decr	Decreased
appre	Apprehension	depres	Depressant/Depression
arrhy	Arrhythmias	derm	Dermatitis
aspir	Aspiration	diarr	Diarrhea
asphy	Asphyxia	dist	Disturbance
BP	Blood pressure	dizz	Dizziness
breath	Breathing	drow	Drowsiness
bron	Bronchitis	dysfunc	Dysfunction
broncopneu	Bronchopneumonia	dysp	Dyspnea (breathing difficulty)
bronspas	Bronchospasm	emphy	Emphysema
BUN	Blood urea nitrogen	eosin	Eosinophilia
[carc]	Potential occupational carcinogen	epilep	Epileptiform
card	Cardiac	epis	Epistaxis (nosebleed)
chol	Cholinesterase	equi	Equilibrium
cirr	Cirrhosis	eryt	Erythema (skin redness)
CNS	Central nervous system	euph	Euphoria
conc	Concentration	fail	Failure
conf	Confusion	fasc	Fasciculation
conj	Conjunctivitis		

(Continued)

Table 5. — Abbreviations for symptoms of exposure and target organs (Continued)

Abbreviation	Symptom/organ	Abbreviation	Symptom/organ
FEV	Forced expiratory volume	jaun	Jaundice
fib	Fibrosis	kera	Keratitis (inflammation of the cornea)
fibr	Fibrillation	lac	Lacrimation (discharge of tears)
ftg	Fatigue	lar	Laryngeal
func	Function	lass	Lassitude (weakness, exhaustion)
GI	Gastrointestinal	leth	Lethargy (drowsiness or indifference)
gidd	Giddiness	leucyt	Leukocytosis (increased blood leukocytes)
halu	Hallucinations	leupen	Leukopenia (reduced blood leukocytes)
head	Headache	li-head	Lightheadedness
hema	Hematuria (blood in the urine)	liq	Liquid
hemato	Hematopoietic	local	Localized
hemog	Hemoglobinuria	low-wgt	Weight loss
hemorr	Hemorrhage	mal	Malaise (vague feeling of discomfort)
hyperpig	Hyperpigmentation	malnut	Malnutrition
hypox	Hypoxemia (reduced oxygen in the blood)	methemo	Methemoglobinemia
inco	Incoordination	monocy	Monocytosis (increased blood monocytes)
incr	Increase(d)	molt	Molten
inebri	Inebriation	muc memb	Mucous membrane
inflamm	Inflammation	musc	Muscle
inj	Injury	narco	Narcosis
insom	Insomnia	nau	Nausea
irreg	Irregular/irregularities		
irrit	Irritation		
irrity	Irritability		

(Continued)

Table 5. — Abbreviations for symptoms of exposure and target organs (Continued)

Abbreviation	Symptom/organ	Abbreviation	Symptom/organ
nec	Necrosis	retster	Retrosternal (occurring behind the sternum)
neph	Nephritis	rhin	Rhinorrhea (discharge of thin nasal mucus)
ner	Nervousness	saiv	Salivation
numb	Numbness	sens	Sensitization
opac	Opacity	sez	Seizure
palp	Palpitations	short	Shortness
para	Paralysis	sneez	Sneezing
pares	Paresthesia	sol	Solid
perf	Perforation	soln	Solution
peri neur	Peripheral neuropathy	som	Somnolence (sleepiness, unnatural drowsiness)
periorb	Periorbital (situated around the eye)	subs	Substernal (occurring beneath the sternum)
phar	Pharyngeal	sweat	Sweating
photo	Photophobia (abnormal visual intolerance to light)	swell	Swelling
pneu	Pneumonia	sys	System
pneuitis	Pneumonitis	tacar	Tachycardia
PNS	Peripheral nervous system	tend	Tenderness
polyneur	Polyneuropathy	terato	Teratogenic
prot	Proteinuria	throb	Throbbing
pulm	Pulmonary	tight	Tightness
RBC	Red blood cell		
repro	Reproductive		
resp	Respiratory		
restless	Restlessness		

(Continued)

Table 5. — Abbreviations for symptoms of exposure and target organs (Continued)

Abbreviation	Symptom/organ	Abbreviation	Symptom/organ
trachbronc	Tracheobronchitis	verti	Vertigo (an illusion of movement)
twitch	Twitching	vesic	Vesiculation
uncon	Unconsciousness	vis dist	Visual disturbance
vap	Vapor	vomit	Vomiting
venfib	Ventricular fibrillation	weak	Weakness
		wheez	Wheezing

Table 6. — Codes for first aid data

Code	Definition	Code	Definition
Eye:			soon as possible.
Irr immed.	If this chemical contacts the eyes, immediately wash the eyes with large amounts of water, occasionally lifting the lower and upper lids. Get medical attention immediately. Contact lenses should not be worn when working with this chemical.	Medical attention	Self-explanatory
Irr prompt	If this chemical contacts the eyes, promptly wash the eyes with large amounts of water, occasionally lifting the lower and upper lids. Get medical attention if any discomfort continues. Contact lenses should not be worn when working with this chemical.	Skin:	
Frostbite	If eye tissue is frozen, seek medical attention immediately; if tissue is not frozen, immediately and thoroughly flush the eyes with large amounts of water for at least 15 minutes, occasionally lifting the lower and upper eyelids. If irritation, pain, swelling, lacrimation, or photophobia persist, get medical attention as	Blot/brush away	If irritation occurs, gently blot or brush away excess.
		Dust off solid; water flush.	If this solid chemical contacts the skin, dust it off immediately and then flush the contaminated skin with water. If this chemical or liquids containing this chemical penetrate the clothing, promptly remove the clothing and flush the skin with water. Get medical attention immediately.
		Frostbite	If frostbite has occurred, seek medical attention immediately; do NOT rub the affected areas or flush them with water. In order to prevent further tissue damage, do NOT attempt to remove frozen clothing from frostbitten areas. If frostbite

(Continued)

Table 6. — Codes for first aid data (Continued)

Code	Definition	Code	Definition
Skin (continued)	has NOT occurred, immediately and thoroughly wash contaminated skin with soap and water.		immediately remove the clothing and flush the skin with water. If irritation persists after washing, get medical attention.
Molten flush immed/sol-liq soap wash prompt	If this molten chemical contacts the skin, immediately flush the skin with large amounts of water. Get medical attention immediately. If this chemical (or liquids containing this chemical) contacts the skin, promptly wash the contaminated skin with soap and water. If this chemical or liquids containing this chemical penetrate the clothing, immediately remove the clothing and wash the skin with soap and water. If irritation persists after washing, get medical attention.	Soap flush prompt ..	If this chemical contacts the skin, promptly flush the contaminated skin with soap and water. If this chemical penetrates the clothing, promptly remove the clothing and flush the skin with water. If irritation persists after washing, get medical attention.
Soap flush immed...	If this chemical contacts the skin, immediately flush the contaminated skin with soap and water. If this chemical penetrates the clothing,	Soap prompt/ molten flush immed	If this solid chemical or a liquid containing this chemical contacts the skin, promptly wash the contaminated skin with soap and water. If irritation persists after washing, get medical attention. If this molten chemical contacts the skin or nonimpervious clothing, immediately flush the affected area with large amounts of water to remove heat. Get medical attention immediately.

Table 6. — Codes for first aid data (Continued)

Code	Definition	Code	Definition
Skin (continued)			
Soap wash	If this chemical contacts the skin, wash the contaminated skin with soap and water.		immediately flush the contaminated skin with water. If this chemical penetrates the clothing, immediately remove the clothing and flush the skin with water. Get medical attention promptly.
Soap wash immed ..	If this chemical contacts the skin, immediately wash the contaminated skin with soap and water. If this chemical penetrates the clothing, immediately remove the clothing, wash the skin with soap and water, and get medical attention promptly.	Water flush prompt .	If this chemical contacts the skin, flush the contaminated skin with water promptly. If this chemical penetrates the clothing, immediately remove the clothing and flush the skin with water promptly. If irritation persists after washing, get medical attention.
Soap wash prompt .	If this chemical contacts the skin, promptly wash the contaminated skin with soap and water. If this chemical penetrates the clothing, promptly remove the clothing and wash the skin with soap and water. Get medical attention promptly.	Water wash	If this chemical contacts the skin, wash the contaminated skin with water.
Water flush	If this chemical contacts the skin, flush the contaminated skin with water. Where there is evidence of skin irritation, get medical attention.	Water wash immed .	If this chemical contacts the skin, immediately wash the contaminated skin with water. If this chemical penetrates the clothing, immediately remove the clothing and wash the skin with water. If symptoms occur
Water flush immed .	If this chemical contacts the skin,		(Continued)

Table 6. — Codes for first aid data (Continued)

Code	Definition	Code	Definition
Skin (continued)	after washing, get medical attention immediately.	Fresh air	If a person breathes large amounts of this chemical, move the exposed person to fresh air at once. Other measures are usually unnecessary.
Water wash prompt	If this chemical contacts the skin, promptly wash the contaminated skin with water. If this chemical penetrates the clothing, promptly remove the clothing and wash the skin with water. If irritation persists after washing, get medical attention.	Fresh air; 100% O ₂	If a person breathes large amounts of this chemical, move the exposed person to fresh air at once. If breathing has stopped, perform artificial respiration. When breathing is difficult, properly trained personnel may assist the affected person by administering 100% oxygen. Keep the affected person warm and at rest. Get medical attention as soon as possible.
Breath:		Swallow:	
Resp support	If a person breathes large amounts of this chemical, move the exposed person to fresh air at once. If breathing has stopped, perform mouth-to-mouth resuscitation. Keep the affected person warm and at rest. Get medical attention as soon as possible.	Medical attention immed	If this chemical has been swallowed, get medical attention immediately.

CHEMICAL LISTING

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Acetaldehyde <chem>CH3CHO</chem> 75-07-0 AB1925000	Acetic aldehyde, Ethanal, Ethyl aldehyde	NIOSH Ca See Appendix A See Appendix C (Aldehydes) OSHA† 200 ppm (360 mg/m³)	Ca [2000 ppm]	Colorless liquid or gas (above 69°F) with a pungent, fruity odor.	MW 44.1 BP 69°F Sol: Miscible FLP -36°F IP: 10.22 eV	VP 740 mm FRZ -190°F UEL 60% LEL 4.0% [#2538]	Strong oxidizers, acids, bases, alcohols, ammonia & amines, phenols, ketones, HCN, H₂S [Note: Prolonged contact with air may cause formation of peroxides that may explode and burst con- tainers, easily undergoes polymerization.]	XAD-2*, Toluene, GC/FID, II
1089 26	1 ppm = 1.83 mg/m³			Sp Gr: 0.79 Class IA Flammable Liquid				
Acetic acid <chem>CH3COOH</chem> 64-19-7 AF1225000	Acetic acid (aqueous), Ethanoic acid, Glacial acetic acid (pure compound), Methanecarboxylic acid [Note: Can be found in concentrations of 5-8% in vinegar.]	NIOSH 10 ppm (25 mg/m³) ST 15 ppm (37 mg/m³) OSHA 10 ppm (25 mg/m³)	50 ppm	Colorless liquid or crystals with a sour, vinegar- like odor. [Note: Pure com- pound is a solid below 62°F. Often used in an aqueous solution.]	MW 60.1 BP 244°F Sol: Miscible FLP 103°F IP: 10.66 eV	VP 11 mm FRZ 62°F UEL(200°F) 19.9% LEL 4.0%	Strong oxidizers (especially chromic acid, sodium peroxide & nitric acid), strong caustics [Note: Corrosive to metals.]	Char, HCOOH, GC/FID, III [#1603]
2789 60 (10-80% acid) 2789 29 (>80% acid)	1 ppm = 2.50 mg/m³			Sp Gr: 1.05 Class II Combustible Liquid				
Acetic anhydride <chem>(CH3CO)2O</chem> 108-24-7 AK1925000	Acetic acid anhydride, Acetic oxide, Acetyl oxide, Ethanoic anhydride	NIOSH C 5 ppm (20 mg/m³) OSHA† 5 ppm (20 mg/m³)	200 ppm	Colorless liquid with a strong, pungent, vinegar- like odor.	MW 102.1 BP 282°F Sol 12% FLP 120°F IP: 10.00 eV	VP 4 mm FRZ -99°F UEL 10.3% LEL 2.7%	Water, alcohols, strong oxidizers (especially chromic acid), amines, strong caustics [Note: Corrosive to iron, steel & other metals. Reacts with water to form acetic acid.]	Bub, Reagent, Vis, III [#3506]
1715 39	1 ppm = 4.24 mg/m³			Sp Gr: 1.08 Class II Combustible Liquid				
Acetone <chem>(CH3)2CO</chem> 67-64-1 AL3150000	Dimethyl ketone, Ketone, propane, 2-Propanone	NIOSH 250 ppm (590 mg/m³) OSHA† 1000 ppm (2400 mg/m³)	2500 ppm [LEL]	Colorless liquid with a fragrant, mint-like odor.	MW 58.1 BP 133°F Sol: Miscible FLP 0°F IP: 9.69 eV	VP 180 mm FRZ -140°F UEL 12.8% LEL 2.5%	Oxidizers, acids	Char, CS, GC/FID, III [#1300, Ketones I]
1090 26	1 ppm = 2.42 mg/m³			Sp Gr: 0.79 Class IB Flammable Liquid				

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 6)	
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet (flam) N.R. Eyewash, Quick drench	NIOSH # SCBAF PD PP/SAF PD,PP ASCBA Escape GMFOV/SCBAE	Inh Ing Con	Irrit eyes, nose, throat, eye, skin burns, derm, conj cough, CNS depres, delayed pulm edema, In animals: kidney, repro, terato effects; [canc]	Eye Skin Breath Swallow	Irrimmed Water flush prompt Resp support Medical attention immed	Eyes, skin, resp sys, kidneys, CNS, repro sys [In animals: nasal cancer]
[Acetaldehyde]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact (>10%) Prevent eye contact When contam (>10%) When wet or contam (>10%) N.R. Eyewash (>5%), Quick drench (>80%)	NIOSH/OSHA 50 ppm: SA:CF/PAPROV/CCRFOV/ GMFOV/SCBAF/SAF § SCBAF PD,PP/SAF PD,PP ASCBA Escape GMFOV/SCBAE	Inh Con	Irrit eyes, skin, nose, throat, eye, skin burns, skin sens, dental erosion, black skin, hyperkeratosis, conj, lac, phar edema, chronic bron	Eye Skin Breath Swallow	Irrimmed Water flush immed Resp support Medical attention immed	Eyes, skin, resp sys, teeth
[Acetic acid]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R. Eyewash, Quick drench	NIOSH/OSHA 125 ppm: SA:CF/PAPROV/ 200 ppm: CCRFOV/GMFOV/PAPROV/ SCBAF/SAF § SCBAF PD,PP/SAF PD,PP ASCBA Escape GMFOV/SCBAE	Inh Ing Con	Conj, lac, corn edema, opac, photo, nasal, phar emr, cough, dysp, bron, skin burns, vesic, sens derm	Eye Skin Breath Swallow	Irrimmed Water flush immed Resp support Medical attention immed	Eyes, skin, resp sys
[Acetic anhydride]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet (flam) N.R. Eyewash, Quick drench	NIOSH 2500 ppm: CCRFOV/PAPROV/GMFOV/ SA/SCBAF § SCBAF PD,PP/SAF PD,PP ASCBA Escape GMFOV/SCBAE	Inh Ing Con	Irrit eyes, nose, throat, head, dizz, CNS depres; derm	Eye Skin Breath Swallow	Irrimmed Soap wash immed Resp support Medical attention immed	Eyes, skin, resp sys, CNS

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TLV unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FL.P, IP, Sp. Gr., flammability	VP, FRZ UEL, LEL		
Acetone cyanohydrin <chem>CH3C(OH)CNCH3</chem> 75-86-5 OD9275000	Cyanohydrin: 2-propanone, 2-Cyano-2-propanol, α -Hydroxyisobutyronitrile, 2-Hydroxy-2-methyl- propanenitrile, 2-Methylactonitrile	NIOSH C 1 ppm (4 mg/m ³) [15-min] OSHA none	N.D.	Colorless liquid with a faint odor of bitter almond. [Note: Forms cyanide in the body.]	MW: 85.1 BP: 203°F Sol: Miscible FL.P: 165°F IP: ? Sp.Gr(77°F): 0.93 Class IIIA Combustible Liquid	VP: 0.8 mm FRZ: -4°F UEL: 12.0% LEL: 2.2%	Sulfuric acid, caustics [Note: Slowly decomposes to acetone & HCN at room temperatures; rate is accelerated by an increase in pH, water content, or temperature.]	Porapak; Ethyl acetate; GC/NPD; II [#2506]
154155	1 ppm = 3.54 mg/m ³							
Acetonitrile <chem>CH3CN</chem> 75-05-8 AL7700000	Cyanomethane, Ethyl nitrile, Methyl cyanide	NIOSH 20 ppm (34 mg/m ³) OSHA† 40 ppm (70 mg/m ³)	500 ppm	Colorless liquid with an aromatic odor. [Note: Forms cyanide in the body.]	MW 41.1 BP 179°F Sol: Miscible FL.P(oc): 42°F IP: 12.20 eV	VP: 73 mm FRZ: -49°F UEL: 16.0% LEL: 3.0%	Strong oxidizers	Char; Benzene; GC/FID; III [#1606]
1548 28	1 ppm = 1.71 mg/m ³				Sp. Gr: 0.78 Class IB Flammable Liquid			
2-Acetylaminofluorene <chem>C12H11NO</chem> 53-96-3 AB9450000	AAF, 2-AAF, 2-Acetylaminofluorene, N-Acetyl-2-aminofluorene, PAA, 2-FAA, 2-Fluorenylacetamide	NIOSH Ca See Appendix A OSHA(1910.1014) See Appendix B	Ca [N.D.]	Tan, crystalline powder.	MW 223.3 BP: ? Sol: Insoluble FL.P: ? IP: ? Sp. Gr: ? Combustible Solid	VP: ? MLT: 381°F UEL: ? LEL: ?	None reported	None available
Acetylene <chem>HC≡CH</chem> 74-86-2 AO9600000	Ethine, Ethyne [Note: A compressed gas used in the welding & cutting of metals.]	NIOSH C 2500 ppm (2662 mg/m ³) OSHA none	N.D.	Colorless gas with a faint, etheral odor. [Note: Commercial grade has a garlic-like odor. Shipped under pressure dissolved in acetone.]	MW: 26.0 BP: Sublimes Sol: 2% FL.P: NA (Gas) IP: 11.40 eV R(GasD: 0.91 Flammable Gas	VP: 44.2 atm FRZ: -119°F (Sublimes) UEL: 100% LEL: 2.5%	Zinc; oxygen & other oxidizing agents such as halogens [Note: Forms explosive acetylide compounds with copper, mercury, silver & brasses (containing more than 66% copper).]	Bag; none; GC/FID; NIOSH Acetylene Crit. Doc.
100117	1 ppm = 1.08 mg/m ³							

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 5)	Target organs (See Table 5)
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, skin, resp sys;	Eye:	Eye, skin, resp sys,
Eyes:	Prevent eye contact	10 ppm: SA	Abs	dizz, weak, head, conf,	Skin:	CNS, CVS, liver,
Wash skin:	When contam	25 ppm: SA:CF	Inh	convuls; liver, kidney inj;	Breath:	kidneys, GI tract
Remove:	When wet or contam	50 ppm: SCBAF/SAF	Con	pulm edema, asphy	Swallow:	
Change:	N.R.	250 ppm: SAF:PD,PP				
Provide:	Eyewash, Quick drench	§: SCBAF:PD,PP/SAF:PD,PP:ASCBA				
		Escape: GMFOV/SCBAE				
[Acetone cyanohydrin]						
Skin:	Prevent skin contact	NIOSH	Inh	Irrit nose, throat; asphy,	Eye:	Resp sys, CVS, CNS,
Eyes:	Prevent eye contact	200 ppm: CCROV/SA	Abs	nau, vomit, chest pain,	Skin:	liver, kidneys
Wash skin:	When contam	500 ppm: SA:CF/PAPROV/CCRFOV/	Inh	weak, stupor, convuls,	Breath:	
Remove:	When wet (flam)	GMFOV/SCBAF/SAF	Con	in animals: liver, kidney	Swallow:	
Change:	N.R.	§: SCBAF:PD,PP/SAF:PD,PP:ASCBA		damage		
Provide:	Quick drench	Escape: GMFOV/SCBAE				
[Acetonitrile]						
Skin:	Prevent skin contact	NIOSH	Inh	Reduced function of	Eye:	Liver, bladder,
Eyes:	Prevent eye contact	¼: SCBAF:PD,PP/SAF:PD,PP:ASCBA	Abs	liver, kidneys, bladder,	Skin:	kidneys, lungs,
Wash skin:	When contam/Daily	Escape: HIEF/SCBAE	Inh	pancreas, [canc]	Breath:	pancreas, skin
Remove:	When wet or contam		Con		Swallow:	[in animals:
Change:	Daily					tumors of the
Provide:	Eyewash, Quick drench					liver, bladder,
						lungs, skin &
						pancreas]
[2-Acetylaminofluorene]						
Skin:	Frostbite	TBAL	Inh	Head, dizz; asphy;	Eye:	CNS, resp sys
Eyes:	Frostbite		Con	liq: frostbite	Skin:	
Wash skin:	N.R.		(liq)		Breath:	
Remove:	When wet (flam)					
Change:	N.R.					
Provide:	Frostbite					
[styrene]						

Chemical name, structural formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TLV unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P, IP, Sp. Gr, flammability	VP, FRZ UEL, LEL		
Acetylene tetrabromide $\text{CHBr}_2\text{CHBr}_2$ 79-27-5 K18225000	Symmetrical tetrabromo- ethane, TBE Tetrabromoacetylene, Tetrabromoethane 1,1,2,2-Tetrabromoethane	NIOSH See Appendix D OSHA 1 ppm (14 mg/m ³)	8 ppm	Pale-yellow liquid with a pungent odor similar to camphor or iodoform [Note: A solid below 32°F]	MW 345.7 BP 474°F (Decomposes) Sol 0.07% Fl.P. NA IP ?	VP 0.02 mm FRZ 32°F UEL NA LEL NA	Strong caustics, hot iron, reducing metals such as aluminum, magnesium & zinc	Sp. gel. T1H GC/FID; III [#2003]
2504 56	1 ppm = 14.37 mg/m ³				Sp. Gr. 2.97 Noncombustible Liquid			
Acetylsalicylic acid $\text{CH}_3\text{COOC}_6\text{H}_4\text{COOH}$ 50-78-2 V00700000	Acetal, o-Acetoxybenzoic acid, 2-Acetoxybenzoic acid, Aspirin	NIOSH 5 mg/m ³ OSHA† none	N.D.	Odorless, colorless to white, crystal- line powder. [aspirin] [Note: Develops the vinegar-like odor of acetic acid on contact with moisture.]	MW: 180.2 BP: 284°F (Decomposes) Sol(77°F): 0.3% Fl.P: NA IP: NA Sp. Gr: 1.38 Combustible Powder; explosion hazard if dispersed in air.	VP: 0 mm (approx) MLT: 275°F UEL: NA LEL: NA NEC: 40 g/m ³	Solutions of alkali hydroxides or carbonates, strong oxidizers, moisture [Note: Slowly hydrolyzes in moist air to salicylic & acetic acids.]	Filter; none; III [#0500, Nausea Dust (total)]
Acrolein $\text{CH}_2=\text{CHCHO}$ 107-02-8 AS1050000	Acrolein, Acrylaldehyde, Acrylic aldehyde, Allyl aldehyde, Propenal, 2-Propenal	NIOSH 0.1 ppm (0.25 mg/m ³) ST 0.3 ppm (0.8 mg/m ³) See Appendix C (Aldehydes) OSHA† 0.1 ppm (0.25 mg/m ³)	2 ppm	Colorless or yellow liquid with a piercing disagreeable odor.	MW 56.1 BP 127°F Sol 40% Fl.P -15°F IP 10.13 eV	VP 210 mm FRZ -126°F UEL 31% LEL 2.8%	Oxidizers, acids, alkalis, ammonia, amines [Note: Polymerizes readily unless inhibited—usually with hydroquinone May form shock- sensitive peroxides over time.]	XAD-2† Toluene GC/NPD, III [#2501]
1092 30 (inhibited)	1 ppm = 2.33 mg/m ³				Sp. Gr. 0.84 Class IB Flammable Liquid			
Acrylamide $\text{CH}_2=\text{CHCONH}_2$ 79-06-1 AS3325000	Acrylamide monomer, Acrylic amide, Propenamide, 2-Propenamide	NIOSH Ca 0.03 mg/m ³ (skin) See Appendix A OSHA† 0.3 mg/m ³ (skin)	Ca [50 mg/m ³]	White crystalline, odorless solid	MW 71.1 BP 347-572°F (Decomposes) Sol(86°F): 20% Fl.P 280°F IP: 9.50 eV Sp Gr 1.12 Combustible Solid May also be dissolved in ...	VP 0.007 mm MLT 184°F UEL ? LEL ?	Strong oxidizers [Note: May polymerize violently upon melting.]	Filter/ Sigel, Methanol, GC/NPD, OSHA [#21]
2074 55								

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 6)	
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R.	OSHA 8 ppm: SA/SCBAF § SCBAF PD, PP/SAF PD, PP ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, nose, anor. nau, severe head, abdom pain, jaun, monoccy, CNS depress	Eye: Skin: Breath: Swallow:	Innmed Water flush prompt Resp support Medical attention innmed	Eyes, resp sys, liver, CNS
[Acetylene tetrabromide]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam N.R. Daily Eyewash, Quick drench	TBAL	Inh Ing Con	Irrit eyes, skin, upper resp sys; incr blood clotting time; nau, vomit, liver, kidney inj	Eye: Skin: Breath: Swallow:	Innmed Soap wash Resp support Medical attention innmed	Eyes, skin, resp sys, blood, liver, kidney
[Acetylsalicylic acid]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet (flam) N.R. Eyewash, Quick drench	NIOSH/OSHA 2 ppm: SA/CP/PAPROV/ICCRFOV/ GMFOV/SCBAF/SAF § SCBAF PD, PP/SAF PD, PP ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, skin, muc memb, decr pulm func, delayed pulm edema; chronic resp disease	Eye: Skin: Breath: Swallow:	Innmed Water flush innmed Resp support Medical attention innmed	Eyes, skin, resp sys, heart
[Acrolein]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam/Daily When wet or contam Daily Eyewash, Quick drench	NIOSH § SCBAF PD, PP/SAF PD, PP ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, skin, ataxia; numb limbs, pares, musc weak, absent deep tendon reflex, hand sweat, flg, leth; repro effects; [carc]	Eye: Skin: Breath: Swallow:	Innmed Water flush innmed Resp support Medical attention innmed	Eyes, skin, CNS, PNS repro sys [in animals: tumors of the lungs, testes, thyroid & adrenal glands]
[Acrylamide]							

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL F.P., IP, Sp, Gr, Flammability	VP, FRZ UEL, LEL		
Acrylic acid $\text{CH}_2=\text{CHCOOH}$ 79-10-7 A54375000	Acroleic acid, Aqueous acrylic acid (technical grade is 94%), Ethylencarboxylic acid, Glacial acrylic acid (98% in aqueous solution), 2-Propenoic acid	NIOSH 2 ppm (6 mg/m ³) [skin] OSHA† none	N.D.	Colorless liquid or solid (below 55°F) with a distinctive, acid odor. [Note: Shipped with an inhibitor (e.g., hydro- quinone) since it readily polymerizes.]	MW: 72.1 BP: 286°F Sol: Miscible F.P.: 121°F IP: ? Sp Gr: 1.05 Class II Combustible Liquid	VP: 3 mm FRZ: 55°F UEL: 8.02% LEL: 2.4%	Oxidizers, amines, alkalis, ammonium hydroxide, chloro- sulfonic acid, oleum, ethylene diamine, ethyleneimine, 2-aminoethanol [Note: Corrosive to many metals.]	XAD(2); Methanol/ water; HPLC/UVD; OSHA [#28]
2218 29	1 ppm = 3.00 mg/m ³							
Acrylonitrile $\text{CH}_2=\text{CHCN}$ 107-13-1 AT5250000	Acrylonitrile monomer, AN Cyanoethylene, Propenenitrile 2-Propenenitrile VCN Vinyl cyanide	NIOSH Ca 1 ppm C: 10 ppm [15-min] [skin] See Appendix A OSHA [1910.1045] 2 ppm C: 10 ppm [15-min] [skin]	Ca [85 ppm]	Colorless to pale- yellow liquid with an unpleasant odor [Note: Odor can only be detected above the PEL.]	MW: 53.1 BP: 171°F Sol: 7% F.P.: 30°F IP: 10.91 eV Sp Gr: 0.81 Class IB Flammable Liquid	VP: 83 mm FRZ: -116°F UEL: 17% LEL: 3.0%	Strong oxidizers, acids & alkalis bromine amines [Note: Unless inhi- bited (usually with methylhydroquinone) may polymerize spontaneously or when heated or in presence of strong alkali. Attacks copper.]	Char: Acetone/ CS, GC/FID, IR [#1604] may polymerize spontaneously or when heated or in presence of strong alkali. Attacks copper]
1093 30 (inhibited)	1 ppm = 2.21 mg/m ³							
Adiponitrile $\text{NC(CH}_2)_4\text{CN}$ 111-69-3 AV2625000	1,4-Dicyanobutane; Hexanedinitrile; Tetramethylene cyanide	NIOSH 4 ppm (16 mg/m ³) OSHA none	N.D.	Water-white, practically odorless, oily liquid. [Note: A solid below 34°F. Forms cyanide in the body.]	MW: 108.2 BP: 563°F Sol: 4.5% F.P. (o.c.): 199°F IP: ? Sp.Gr: 0.97 Class IIIA Combustible Liquid	VP: 0.002 mm FRZ: 34°F UEL: 5.0% LEL: 1.7%	Oxidizers (e.g., perchlorates, nitrates), strong acids (e.g., sulfuric acid) [Note: Decomposes above 194°F, forming hydrogen cyanide.]	Char: Toluene; GC/FID; NIOSH Nitriles Crit. Doc.
2205 55	1 ppm = 4.60 mg/m ³							
Aldrin $\text{C}_{12}\text{H}_{10}\text{Cl}_6$ 309-00-2 I02100000	1,2,3,4,10,10-Hexachloro- 1,4,4a,5,8,8a-hexahydro- endo-1,4-exo-5,8- dimethanonaphthalene; HECN Octolene	NIOSH Ca 0.25 mg/m ³ [skin] See Appendix A OSHA 0.25 mg/m ³ [skin]	Ca [25 mg/m ³]	Colorless to dark- brown crystalline solid with a mild chemical odor [Note: Formerly used as an insecticide.]	MW: 364.9 BP: Decomposes Sol: 0.003% F.P.: NA IP: ? Sp Gr: 1.60 Noncombustible Solid, but may be dissolved in flammable liquids	VP: 0.00008 mm MLT: 219°F UEL: NA LEL: NA	Concentrated mineral acids, active metals, acid catalysts, acid oxidizing agents, phenol	Filter/Bub, Isocitane GC/ECN/D, IR [#5502]
2761 55								

Personal protection and sanitation (See Table 3)	Recommendations for respirator selection --- maximum concentration for use (MUC) (See Table 4)	Health hazards			
		Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R. Provide: Eyewash, Quick drench	TBAL	Inh Abs Ing Con	Irrit eyes, skin, resp sys; eye, skin burns; skin sens; In animals: lung, liver, kidney inj	Eye: Skin: Breath: Swallow: Irritated Water flush Resp support Medical attention immed	Eyes, skin, resp sys
[Acrylic acid]					
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flammi) Change: N.R. Provide: Eyewash, Quick drench	NIOSH * SCBAF PD PP/SAF PD PP ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, skin, asphy; head, sneez; nau, vomit, weak li-head, skin vesic, scaling derm, [carc]	Eye: Skin: Breath: Swallow: Irritated Water wash Resp support Medical attention immed	Eyes, skin, CVS liver, kidneys, CNS [brain tumors, lung & bowel cancer]
[Acrylonitrile]					
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily	NIOSH 40 ppm: SA 100 ppm: SA, CF 200 ppm: SCBAF/SAF 250 ppm: SAF, PD, PP §: SCBAF, PD, PP/SAF, PD, PP, ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, skin, resp sys; head, dizz, weak, gidd, conf, convuls, blurred vision; dysp, abdominal pain, nau, vomit	Eye: Skin: Breath: Swallow: Irritated Soap wash Resp support Medical attention immed	Eyes, skin, resp sys, CNS, CVS
[Adiponitrile]					
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam/Daily Remove: When wet or contam Change: Daily Provide: Eyewash, Quick drench	NIOSH * SCBAF PD PP/SAF PD PP ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Head, dizz, nau, vomit, mal, myoclonic jerks of limbs, clonic tonic convuls, coma, hema, azotemia, [carc]	Eye: Skin: Breath: Swallow: Irritated Soap wash Resp support Medical attention immed	Cancer, CNS, liver, kidneys, skin [In animals: tumors of the lungs, liver, thyroid & adrenal glands]
[Aldrin]					

Chemical name, structural formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TLV unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P., IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Allyl alcohol $\text{CH}_2=\text{CHCH}_2\text{OH}$ 107-18-6 BA5075000	A.A. Allylic alcohol Propenol 1-Propen-3-ol, 2-Propenol Vinyl carbinol	NIOSH 2 ppm (5 mg/m ³) ST 4 ppm (10 mg/m ³) [skin]	20 ppm	Colorless liquid with a pungent mustard-like odor.	MW 58.1 BP 205°F Sol: Miscible Fl.P. 70°F IP 9.63 eV	VP 17 mm FRZ -200°F UEL 18.0% LEL 2.5%	Strong oxidizers, acids, carbon tetrachloride [Note: Polymerization may be caused by elevated tempera- tures, oxidizers, or peroxides.]	Char 2-Propanol/ CS, GC/FID; III [#1402, Alcohols III]
1098 57	1 ppm = 2.42 mg/m ³	OSHA† 2 ppm (5 mg/m ³)			Sp Gr 0.85 Class IB Flammable Liquid			
Allyl chloride $\text{CH}_2=\text{CHCH}_2\text{Cl}$ 107-05-1 UC 7350000	3-Chloropropene, 1-Chloro-2-propene, 3-Chloropropylene	NIOSH 1 ppm (3 mg/m ³) ST 2 ppm (6 mg/m ³)	250 ppm	Colorless, brown, yellow, or purple liquid with a pungent, unpleasant odor.	MW 76.5 BP 113°F Sol 0.4% Fl.P. -25°F IP 10.05 eV	VP 295 mm MLT -210°F UEL 11.1% LEL 2.9%	Strong oxidizers, acids, amines, iron & aluminum chlorides, magnesium, zinc	Char; Benzene; GC/FID; III [#1000]
1100 57	1 ppm = 3.18 mg/m ³	OSHA† 1 ppm (3 mg/m ³)			Sp Gr 0.94 Class IB Flammable Liquid			
Allyl glycidyl ether $\text{C}_6\text{H}_{10}\text{O}_2$ 106-92-3 RR0875000	AGE 1-Allyloxy-2,3-epoxypropane; Glycidyl allyl ether [[(2-Propenyloxy)methyl] oxirane]	NIOSH 5 ppm (22 mg/m ³) ST 10 ppm (44 mg/m ³) [skin]	50 ppm	Colorless liquid with a pleasant odor	MW 114.2 BP 309°F Sol 14% Fl.P. 135°F IP ?	VP 2 mm FRZ -148°F [forms glass] UEL ? LEL ?	Strong oxidizers	Tenax GC, Diethyl ether; GC/FID; III [#S346]
2219 29	1 ppm = 4.75 mg/m ³	OSHA† C 10 ppm (45 mg/m ³)			Sp Gr 0.97 Class II Combustible Liquid			
Allyl propyl disulfide $\text{H}_2\text{C}=\text{CHCH}_2\text{S}_2\text{CH}_2\text{CH}_2\text{CH}_3$ 2179-88-1 JO0360000	4,6-Dithia-1-octene; Onion oil; 2-Propenyl propyl disulfide; Propyl allyl disulfide	NIOSH 2 ppm (12 mg/m ³) ST 3 ppm (18 mg/m ³)	N.D.	Pale-yellow liquid with a strong & irritating onion-like odor. [Note: The chief volatile component of onion oil.]	MW: 148.3 BP: 7 Sol: Insoluble Fl.P.: 7 IP: 7	VP: ? FRZ: 5°F UEL: ? LEL: ?	Oxidizers	None available
	1 ppm = 6.16 mg/m ³	OSHA† 2 ppm (12 mg/m ³)			Sp Gr (59°F): 0.93 Combustible Liquid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 6)
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Eye irrit., tissue damage,	Eye	Eyes, skin, resp sys
Eyes:	Prevent eye contact	20 ppm: SA/CF/PAPROV/GMFOV/	Abs	irrit. upper resp. sys.	Irritated	
Wash skin:	When contam.	GMFOV/SCBAF/SAF	Ing	skin, pulm. edema	Water flush immed	
Remove:	When wet (flam.)	§ SCBAF PD PP/SAF PD PP ASCBA	Con		Breath	
Change:	N.R.	Escape GMFOV/SCBAE			Swallow	
Provide:	Quick drench				Medical attention immed	
[Allyl alcohol]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit. eyes, skin, nose	Eye	Eyes, skin, resp sys.
Eyes:	Prevent eye contact	25 ppm: SA/CF*	Abs	muc. memb.; pulm. edema	Irritated	
Wash skin:	When contam.	50 ppm: SCBAF/SAF	Ing	in animals: liver, kidney inj.	Soap wash immed	
Remove:	When wet (flam.)	250 ppm: SAF/PD, PP	Con		Resp. support	
Change:	N.R.	§ SCBAF PD PP/SAF PD PP ASCBA			Medical attention immed	
Provide:	Quick drench	Escape GMFOV/SCBAE				
[Allyl chloride]						
Skin:	Prevent skin contact	NIOSH	Inh	Irrit. eyes, skin, nose	Eye	Eyes, skin, resp sys.
Eyes:	Prevent eye contact	60 ppm: CCROV/PAPROV/GMFOV/	Abs	resp. sys., derm., pulm. edema,	Irritated	
Wash skin:	When contam.	SA/SCBAF	Ing	narco. possible hemato,	Water flush prompt	
Remove:	When wet or contam.	§ SCBAF PD PP/SAF PD PP ASCBA	Con	repro effects	Resp. support	
Change:	N.R.	Escape GMFOV/SCBAE			Medical attention immed	
Provide:	Eyewash					
[Allyl glycidyl ether]						
Skin:	N.R.	TBAL	Inh	Irrit. eyes, nose, resp sys.; lac.	Eye:	Eyes, resp sys.
Eyes:	Prevent eye contact		Ing		Skin:	
Wash skin:	N.R.		Con		Breath:	
Remove:	When wet or contam.				Swallow:	
Change:	N.R.					
Provide:						
[Allyl propyl disulfide]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL, FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
α-Alumina Al_2O_3 1344-28-1 BD1200000	Alumina, Aluminum oxide, Aluminum trioxide [Note: α-Alumina is the main component of technical grade alumina. Corundum is natural Al_2O_3 . Emery is an impure crystalline variety of Al_2O_3 .]	NIOSH See Appendix D OSHA† 15 mg/m³ (total) 5 mg/m³ (resp)	N.D.	White, odorless, crystalline powder.	MW: 101.9 BP: 5196°F Sol: Insoluble FLP: NA IP: NA Sp.Gr: 4.0 Noncombustible solid, but dusts may form explosive mixtures in air.	VP: 0 mm (approx) MLT: 3632°F UEL: NA LEL: NA	Chlorine trifluoride, hot chlorinated rubber, acids, oxidizers [Note: Hydrogen gas may be formed when finely divided iron contacts moisture during crushing & milling operations.]	Filter; none; Grav; ■ [Balance Dust: #0500 (total), #0600 (resp)]
Aluminum Al 7429-90-6 BD0330000	Aluminum, Aluminum metal, Aluminum powder, Elemental aluminum	NIOSH 10 mg/m³ (total) 5 mg/m³ (resp) OSHA 15 mg/m³ (total) 5 mg/m³ (resp)	N.D.	Silvery-white, malleable, ductile, odorless metal.	MW: 27.0 BP: 4221°F Sol: Insoluble FLP: NA IP: NA Sp.Gr: 2.70 Combustible Solid, finely divided dust is easily ignited; may cause explosions.	VP: 0 mm (approx) MLT: 1220°F UEL: NA LEL: NA	Strong oxidizers & acids, halogenated hydrocarbons [Note: Corrodes in contact with acids & other metals. Ignition may occur if powders are mixed with halogens, carbon disulfide, or methyl chloride.]	Filter; HNO; AAS; ■ [§7013, Aluminum]
Aluminum (pyro powders and welding fumes, as Al)	Synonyms vary depending upon the specific aluminum compound.	NIOSH 5 mg/m³ OSHA† none	N.D.	Appearance and odor vary depending upon the specific aluminum compound.	Properties vary depending upon the specific aluminum compound.	Varies	Varies	Filter; HNO; AAS; ■ [§7013, Aluminum]
Aluminum (soluble salts and alkyls, as Al)	Synonyms vary depending upon the specific aluminum compound.	NIOSH 2 mg/m³ OSHA† none	N.D.	Appearance and odor vary depending upon the specific aluminum compound.	Properties vary depending upon the specific aluminum compound.	Varies	Varies	Filter; HNO; AAS; ■ [§7013, Aluminum]

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)		Target organs (See Table 5)
Skin:	N.R.	TBAL	Inh Ing Con	Irrit eyes, skin, resp sys	Eye: Skin: Breath: Swallow:	Irritated Blot/brush away Fresh air Medical attention Irritated	Eyes, skin, resp sys
Eyes:	N.R.						
Wash skin:	N.R.						
Remove:	N.R.						
Change:	N.R.						
[α-Alumina]							
Skin:	N.R.	TBAL	Inh Con	Irrit eyes, skin, resp sys	Eye: Breath:	Irritated Fresh air	Eyes, skin, resp sys
Eyes:	N.R.						
Wash skin:	N.R.						
Remove:	N.R.						
Change:	N.R.						
[Aluminum]							
Skin:	N.R.	TBAL	Inh Ing Con	Irrit skin, resp sys; pulm fib	Eye: Skin: Breath: Swallow:	Irritated Water flush Irritated Resp support Medical attention Irritated	Skin, resp sys
Eyes:	N.R.						
Wash skin:	N.R.						
Remove:	N.R.						
Change:	N.R.						
[Aluminum (pyro powders and welding fumes, as Al)]							
Skin:	Prevent skin contact	TBAL	Inh Ing Con	Irrit skin, resp sys; skin burns	Eye: Skin: Breath: Swallow:	Irritated Water flush Irritated Resp support Medical attention Irritated	Skin, resp sys
Eyes:	Prevent eye contact						
Wash skin:	When contam						
Remove:	When wet or contam						
Change:	Daily						
[Aluminum (soluble salts and hydroxide, as Al)]							

Chemical name, structure/formula, CAS and RTECS Nos., and DOTID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
4-Aminodiphenyl $C_6H_4C_6H_4NH_2$ 92-67-1 DU8925000	4-Aminobiphenyl, p-Aminobiphenyl, p-Aminodiphenyl, 4-Phenylaniline	NIOSH Ca See Appendix A OSHA(1910.1011) See Appendix B	Ca [N.D.]	Colorless crystals with a floral odor [Note: Turns purple on contact with air]	MW 169.2 BP 578°F Sol: Slight FIP ? IP ? Sp Gr 1.16 Combustible Solid, but must be preheated before ignition possible	VP(227°F): 1 mm MLT 127°F UEL ? LEL ?	Oxidized by air	Filter/ Sig el, 2-Propandl; GC/FID, II(4), IP & CAM #269]
2-Aminopyridine $NH_2C_5H_4N$ 504-29-0 US1575000	α -Aminopyridine, α -Pyridylamine	NIOSH/OSHA 0.5 ppm (2 mg/m ³)	5 ppm	White powder, leaflets, or crystals with a characteristic odor.	MW 94.1 BP 411°F Sol >100% FIP 154°F IP 8.00 eV	VP(77°F): 0.8 mm MLT 137°F UEL ? LEL ?	Strong oxidizers	Tenax GC(2), Thermal desorp, GC/FID, III [#S158]
2671.55	1 ppm = 3.91 mg/m ³				Sp Gr: ? Combustible Solid			
Ambrole $C_6H_4N_4$ 61-82-5 XZ3850000	Aminotriazole; 3-Aminotriazole; 2-Amino-1,3,4-triazole; 3-Amino-1,2,4-triazole	NIOSH Ca 0.2 mg/m ³ See Appendix A OSHA† none	Ca [N.D.]	Colorless to white, crystalline powder. [herbicide] [Note: Odorless when pure.]	MW: 84.1 BP: ? Sol(77°F): 28% FIP: NA IP: ? Sp.Gr: 1.14 Noncombustible Solid, but may be dissolved in flammable liquids.	VP: <0.000006 mm MLT: 318°F UEL: NA LEL: NA	Light (decomposes), strong oxidizers [Note: Corrosive to iron, aluminum & copper.]	Filter; none; Grav; III [#0500, Nussance Dust (total)]
Ammonia NH_3 7664-41-7 B00075000 1005.15 (anhydrous) 2672.60 (12.44% soln) 2073.15 (>44% soln)	Anhydrous ammonia, Aqua ammonia, Aqueous ammonia [Note: Often used in an aqueous solution.] 1 ppm = 0.71 mg/m ³	NIOSH 25 ppm (18 mg/m ³) ST 35 ppm (27 mg/m ³) OSHA† ST 50 ppm (35 mg/m ³)	300 ppm	Colorless gas with a pungent, suffo- cating odor [Note: Shipped as a liquefied compressed gas. Easily liquefied under pressure.]	MW 17.0 BP -28°F Sol 34% FIP NA (Gas) IP 10.18 eV R Gas D: 0.60 [Note: Although NH_3 does not meet the DOT definition of a Flammable Gas (for labeling purposes), it should be treated as one.]	VP 8.5 atm FRZ -106°F UEL 28% LEL 15%	Strong oxidizers, acids, halogens, salts of silver & zinc [Note: Corrosive to copper & galvanized surfaces.]	Pestive sampler, none, IC, III [#6701]

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	Prevent skin contact	NIOSH	Inh	Head dizz leth dysp,	Eye	Bladder skin
Eyes:	Prevent eye contact	§ SCBAF PD PP/SAF PD,PP ASCBA	Abs	ataxia weak methemo,	Skin	[bladder cancer]
Wash skin:	When contam/Daily	Escape: HEF/SCBAE	Ing	urinary burning acute	Breath	Resp support
Remove:	When wet or contam		Con	hemorrhagic cystitis, [canc]	Swallow	Medical attention immed
Change:	Daily					
Provide:	Eyewash, Quick drench					
[4-Aminodiphenyl]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, nose, throat;	Eye	CNS resp sys
Eyes:	Prevent eye contact	5 ppm: SA*/SCBAF	Abs	head dizz excitement,	Skin	
Wash skin:	When contam	§ SCBAF PD PP/SAF PD PP ASCBA	Ing	nausea, high BP resp	Breath	
Remove:	When wet or contam	Escape: GMFOVH/SCBAE	Con	distress weak, convuls,	Swallow	
Change:	Daily			stupor		
Provide:	Quick drench					
[2-Aminopyridine]						
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, skin; dysp,	Eye:	Eyes, skin, thyroid
Eyes:	Prevent eye contact	§ SCBAF PD PP/SAF PD,PP:ASCBA	Ing	muscle spasms, ataxia, anor,	Skin:	[in animals: liver,
Wash skin:	Daily	Escape: GMFOVH/SCBAE	Con	saliv, incr body temperature;	Breath:	thyroid & pituitary
Remove:	When wet or contam			lassa, skin dryness, depres	Swallow:	gland tumors]
Change:	Daily			(thyroid func suppression)		
Provide:	Eyewash, Quick drench					
[Amitrole]						
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes nose, throat,	Eye	Eyes, skin, resp sys
Eyes:	Prevent eye contact	250 ppm: CCRS*/SA*	Ing	dysp, bronspas, chest	Skin	
Wash skin:	When contam (soln)	300 ppm: SA, CF*/PAPRS*/CCRFM/	(soln)	pain, pulm edema pink		
Remove:	When wet or contam (soln)	GMFS/SCBAF/SAF	Con	frothy sputum, skin burns,	Breath	Water flush immed
Change:	N.R.	§ SCBAF PD PP/SAF PD,PP ASCBA	(soln/liq)	vesic, liq, frostbite	Swallow	(soln/liq)
Provide:	Eyewash (>10%), Quick drench (>10%)	Escape: GMFS/SCBAE				Resp support Medical attention immed (soln)
[Ammonia]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TLV unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Ammonium chloride fume NH_4Cl 12125-02-9 BP4550000	Ammonium chloride, Ammonium muriate fume, Sal ammoniac fume	NIOSH 10 mg/m ³ ST 20 mg/m ³ OSHA† none	N.D.	Finely divided, odorless, white particulate dispersed in air.	MW: 53.5 BP: Sublimes Sol: 37% Fl.P: NA IP: NA Sp.Gr: 1.53 Noncombustible Solid	VP(321°F): 1 mm MLT: 662°F (Sublimes) UEL: NA LEL: NA	Alkalis & their carbonates, lead & silver salts, strong oxidizers, ammonium nitrate, potassium chlorate, bromine trifluoride [Note: Corrodes most metals at high (i.e., fire) temperatures.]	Filter; Water; IC; OSHA [NIOSH]
Ammonium sulfate $\text{NH}_4\text{OSO}_3\text{NH}_2$ 7773-06-0 WO6125000	Ammonate® herbicide, Ammonium amidosulfonate, AMS, Monoammonium salt of sulfamic acid, Sulfamate	NIOSH 10 mg/m ³ (total) 5 mg/m ³ (resp) OSHA† 15 mg/m ³ (total) 5 mg/m ³ (resp)	1500 mg/m ³	Colorless to white crystalline, odorless solid. [herbicide]	MW 114.1 BP 320°F (Decomposes) Sol 200% Fl.P. NA IP ? Sp Gr 1.77 Noncombustible Solid	VP: 0 mm (approx) MLT: 258°F UEL NA LEL NA	Acids, hot water [Note: Elevated temperatures cause a highly exothermic reaction with water]	Filter; Water; IC II(5) [#S348]
n-Amyl acetate $\text{CH}_3\text{COO}(\text{CH}_2)_4\text{CH}_3$ 628-63-7 AJ1925000	Amyl acetic ester, Amyl acetic ether, 1-Pentanol acetate, Pentyl ester of acetic acid, Primary amyl acetate	NIOSH/OSHA 100 ppm (525 mg/m ³)	1000 ppm	Colorless liquid with a persistent, banana-like odor	MW 130.2 BP 301°F Sol 0.2% Fl.P 77°F IP ? Sp Gr 0.86 Class IC Flammable Liquid	VP 4 mm FRZ -95°F UEL 7.5% LEL 1.1%	Nitrates, strong oxidizers, alkalis & acids	Char, CS, GCFID, II [#1450, Esters I]
1104 26	1 ppm = 5.41 mg/m ³							
sec-Amyl acetate $\text{CH}_3\text{COOCH}(\text{CH}_3)\text{C}_4\text{H}_9$ 626-38-0 AJ2100000	1-Methylbutyl acetate, 2-Pentanol acetate, 2-Pentyl ester of acetic acid	NIOSH/OSHA 125 ppm (650 mg/m ³)	1000 ppm	Colorless liquid with a mild odor.	MW 130.2 BP 249°F Sol Slight Fl.P 89°F IP ? Sp Gr 0.87 Class IC Flammable Liquid	VP 7 mm FRZ -109°F UEL 7.8% LEL 1%	Nitrates, strong oxidizers, alkalis & acids	Char, CS, GCFID, II [#1450, Esters I]
1104 26	1 ppm = 5.41 mg/m ³							

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)		Target organs (See Table 5)
Skin:	Prevent skin contact	TBAL	Inh	Irrit eyes, skin, resp sys;	Eye:	Trimmed	Eyes, skin, resp sys
Eyes:	Prevent eye contact		Con	cough, dysp, pulm sens	Skin:	Soap wash immed	
Wash skin:	When contam				Breath:	Resp support	
Remove:	When wet or contam						
Change:	Daily						
Provide:	Eyewash, Quick drench						
[Ammonium chloride fume]							
Skin:	N.R.	NIOSH	Inh	Irrit eyes, nose, throat,	Eye:	Trimmed	Eyes, resp sys
Eyes:	N.R.	50 mg/m ³ DM	Con	cough, dysp	Skin:	Soap wash prompt	
Wash skin:	N.R.	100 mg/m ³ DMXSO/SA			Breath:	Resp support	
Remove:	N.R.	250 mg/m ³ SA, CF/PAPRDM			Swallow	Medical attention	
Change:	N.R.	500 mg/m ³ : SA, T, CF/PAPRTNIE/HIEF/ SCBAF/SAF				immed	
		1500 mg/m ³ : SA, PD, PP					
		§ SCBAF, PD, PP/SAF, PD, PP, ASCBA					
		Escape: HIEF/SCBAE					
[Ammonium sulfate]							
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, nose, derm,	Eye:	Trimmed	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	1000 ppm: CCROV*/GMFOV/PAPROV*/	Ing	possible CNS depres,	Skin:	Water flush prompt	CNS
Wash skin:	When contam	SA*/SCBAF	Con	narco	Breath:	Resp support	
Remove:	When wet (flam)	§ SCBAF, PD, PP/SAF, PD, PP, ASCBA			Swallow	Medical attention	
Change:	N.R.	Escape: GMFOV/SCBAE				immed	
[n- Amyl acetate]							
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin, nose,	Eye:	Trimmed	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	1000 ppm: CCROV*/GMFOV/PAPROV*/	Ing	narco, derm, possible kidney,	Skin:	Water flush prompt	kidneys, liver, CNS
Wash skin:	When contam	SA*/SCBAF	Con	liver inj; possible CNS	Breath:	Resp support	
Remove:	When wet (flam)	§ SCBAF, PD, PP/SAF, PD, PP, ASCBA		depres	Swallow	Medical attention	
Change:	N.R.	Escape: GMFOV/SCBAE				immed	
[sec- Amyl acetate]							

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement (See Table 1)
					MW, BP, SOL Fl.P, IP, Sp, Gr, Flammability	VP, FRZ UEL, LEL		
Aniline (and homologs) $C_6H_5NH_2$ 62-53-3 BW6650000	Aminobenzene, Aniline oil, Benzenamine, Phenylamine	NIOSH Ca See Appendix A OSHA* 6 ppm (19 mg/m³) [skin]	Ca [100 ppm]	Colorless to brown, only liquid with an aromatic amine- like odor [Note: A solid below 21°F]	MW 93.1 BP 363°F Sol 4% Fl.P 158°F IP 770 eV	VP 0.6 mm FRZ 21°F UEL 11% LEL 1.3%	Strong oxidizers, strong acids, toluene diisocyanate, alkalis	Sig. Et., Ethanol, GC/MS, II [#2002, Aromatic Amines]
1547 57	1 ppm = 3.87 mg/m³				Sp Gr 1.02 Class IIIA Combustible Liquid			
o-Anisidine $NH_2C_6H_4OCH_3$ 90-04-0 BZ5410000	ortho-Aminoanisole, 2-Anisidine, o-Methoxyaniline [Note: o-Anisidine has been used as a basis for many dyes.]	NIOSH Ca 0.5 mg/m³ [skin] See Appendix A OSHA 0.5 mg/m³ [skin]	Ca [50 mg/m³]	Red or yellow, oily liquid with an amine-like odor [Note: A solid below 41°F]	MW 123.2 BP 437°F Sol(77°F): 1% Fl(Proc) 244°F IP 7.44 eV	VP <0.1 mm FRZ 41°F UEL ? LEL ?	Strong oxidizers	XAD-2, Methanol, HPLC/UV- II [#2514]
2431 55	1 ppm = 5.12 mg/m³				Sp Gr 1.10 Class IIIB Combustible Liquid			
p-Anisidine $NH_2C_6H_4OCH_3$ 104-94-9 BZ5450000	para-Aminoanisole, 4-Anisidine, p-Methoxyaniline	NIOSH/OSHA 0.5 mg/m³ [skin]	50 mg/m³	Yellow to brown, crystalline solid with an amine-like odor.	MW 123.2 BP 475°F Sol. Moderate Fl.P ? IP 7.44 eV	VP(77°F): 0.006 mm MLT 135°F UEL ? LEL ?	Strong oxidizers	XAD-2 Methanol, HPLC/UV- II [#2514]
2431 55	1 ppm = 5.12 mg/m³				Sp Gr 1.07 Combustible Solid			
Antimony Sb 7440-36-0 CC4025000	Antimony metal, Antimony powder, Stibium	NIOSH*OSHA* 0.5 mg/m³ [*Note: The REL and PEL also apply to other Antimony compounds (as Sb).]	50 mg/m³ (as Sb)	Silver-white lustrous, hard, brittle solid, scale-like crystals, or a dark-gray, lustrous powder.	MW 121.8 BP 1975°F Sol Insoluble Fl.P NA IP NA	VP 0 mm (approx) MLT 1165°F UEL NA LEL NA	Strong oxidizers, acids halogenated acids [Note: Stibine is formed when antimony is exposed to nascent (freshly formed) hydrogen]	Fiber, Acid, AAS, II(4) [P&CAM #261]
2871 53 (powder)					Sp Gr 6.69 Noncombustible Solid in bulk form, but a moderate explosion hazard in the form of dust or finely divided material			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)		Target organs (See Table 5)
Skin:	Prevent skin contact	NIOSH	Inh	Head, weak, dizzy, cyan.	Eye	Immerse	Blood, CVS, eyes.
Eyes:	Prevent eye contact	§ SCBAF PD, PP/SAF PD, PP ASCBA	Abs	ataxia, dysp on effort,	Skin	Soap wash prompt	liver, kidneys, resp
Wash skin:	When contam	Escape: GMFOV/SCBAE	Ing	tacur, irrit eyes,	Breath	Resp support	sys
Remove:	When wet or contam		Con	methemo; circ; [carc]	Swallow	Medical attention	[in animals:
Change:	N.R.					immed	tumors of the
Provide:	Quick drench						spleen]
[Amine (and homologs)]							
Skin:	Prevent skin contact	NIOSH	Inh	Head, dizzy, cyan.	Eye	Immerse	Blood, kidneys,
Eyes:	Prevent eye contact	§ SCBAF PD, PP/SAF PD, PP ASCBA	Abs	RBC Heinz bodies. [carc]	Skin	Soap wash immed	liver, CVS, CNS
Wash skin:	When contam	Escape: GMFOV/SCBAE	Ing		Breath	Resp support	[in animals:
Remove:	When wet or contam		Con		Swallow	Medical attention	tumors of the
Change:	Daily					immed	thyroid gland,
Provide:	Eyewash, Quick drench						bladder & kidneys]
[o-Anilidine]							
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Head, dizzy, cyan.	Eye	Immerse	Blood, kidneys,
Eyes:	Prevent eye contact	5 mg/m ³ : DMXSO ² /SA	Abs	RBC Heinz bodies. [carc]	Skin	Soap wash immed	liver, CVS, CNS
Wash skin:	When contam	12.5 mg/m ³ : SA, CF/PAPRDM	Ing		Breath	Resp support	
Remove:	When wet or contam	25 mg/m ³ : HIEF/PAPRTHIE/SCBAF/SAF	Con		Swallow	Medical attention	
Change:	Daily	50 mg/m ³ : SA, PD, PP*				immed	
Provide:	Quick drench	§: SCBAF, PD, PP/SAF, PD, PP/ASCBA					
		Escape: HIEF/SCBAE					
[p-Anilidine]							
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin, nose,	Eye:	Immerse	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	5 mg/m ³ : DMXSO ² /SA	Ing	throat, mouth, cough, dizzy,	Skin	Soap wash immed	CVS
Wash skin:	When contam	12.5 mg/m ³ : SA, CF/PAPRDM*	Con	head, nau, vomit, diarr,	Breath	Resp support	
Remove:	When wet or contam	25 mg/m ³ : HIEF/SAT, CF/PAPRTHIE/		stomach cramps, insom, anor,	Swallow	Medical attention	
Change:	Daily	SCBAF/SAF		unable to smell properly		immed	
		50 mg/m ³ : SA, PD, PP					
		§ SCBAF, PD, PP/SAF, PD, PP ASCBA					
		Escape: HIEF/SCBAE					
[Antimony]							

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
ANTU $C_{10}H_8NHC(NH_2)_2S$ 86-88-4 YT9275000	α -Naphthyl thio carbamide, 1-Naphthyl thiourea, α -Naphthyl thiourea	NIOSH/OSHA 0.3 mg/m ³	100 mg/m ³	White crystalline or gray, odorless powder [rodenticide]	MW 202.3 BP: Decomposes Sol: 0.06% F.L.P. NA	VP: Low MLT: 388°F UEL: NA LEL: NA IP: ?	Strong oxidizers, silver nitrate	Filter; Methanol HPLC/UVD, II(5) [85276]
1651 53					Sp. Gr. ? Noncombustible Solid			
Arsenic (inorganic compounds, as As)	Arsenic metal; Arsenia Other synonyms vary depending upon the specific As compound. [Note: OSHA considers "inorganic Arsenic" to mean copper arsenite & all inorganic compounds containing arsenic except Arsenic.]	NIOSH Ca C 0.002 mg/m ³ [15-min] See Appendix A	Ca [5 mg/m ³ (as As)]	Metal: Silver-gray or tin-white, brittle, odorless solid	MW 74.9 BP: Sublimes Sol: Insoluble F.L.P. NA IP: NA	VP: 0 mm (approx) MLT: 1135°F (Sublimes) UEL: NA LEL: NA	Strong oxidizers, bromine azide [Note: Hydrogen gas can react with inorganic arsenic to form the highly toxic gas arsine.]	Filter; Acid, AAS, II [87900]
7440-38-2 (Metal) CG0525000 (Metal)		OSHA [1910.1018] 0.010 mg/m ³			Sp. Gr. 5.73 (Metal) Metal: Noncombustible Solid in bulk form, but a slight explosion hazard in the form of dust when exposed to flame			
1558 53 (Metal)								
Arsenic (organic compounds, as As)	Synonyms vary depending upon the specific organic arsenic compound.	NIOSH none OSHA 0.5 mg/m ³	N.D.	Appearance and odor vary depending upon the specific organic arsenic compound.	Properties vary depending upon the specific organic arsenic compound.	Varies	Filter; Reagent; IC; II [85022, Arsenic, organo-]	
Arsine AsH_3 7784-42-1 CG6475000	Arsenic hydride, Arsenic trihydride, Arsenuretted hydrogen, Arsenous hydride, Hydrogen arsenide	NIOSH Ca C 0.002 mg/m ³ [15-min] See Appendix A OSHA 0.05 ppm (0.2 mg/m ³)	Ca [3 ppm]	Colorless gas with a mild, garlic-like odor [Note: Shipped as a liquefied compressed gas.]	MW 78.0 BP: -61°F Sol: 20% F.L.P. NA (Gas) IP: 9.89 eV	VP (70°F) 14.9 atm FRZ: -179°F UEL 78% LEL 5.1%	Strong oxidizers, chlorine, nitric acid [Note: Decomposes above 446°F. There is a high potential for the generation of arsine gas when inorganic arsenic is exposed to nascent (freshly formed) hydrogen.]	Char, HNO ₃ , AAS/GF, II [86001]
2188 18	1 ppm = 3.24 mg/m ³				R.C. as D: 2.69 Flammable Gas			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin: Eye: Wash skin: Remove: Change:	N.R. N.R. N.R. N.R. Daily	NIOSH/OSHA 3 mg/m ³ CCRD/DMFu/SA 7.5 mg/m ³ SA CF/PAPROVDMFu 15 mg/m ³ CCRFOVHE/GMFOVHE/ PAPROVHE/SAT CF/ SCBAF/SAF 100 mg/m ³ SA PD PP 6 SCBAF PD PP/SAF PD PP ASCBA Escape GMFOVHE/SCBAE	Inh ing	After ingestion of large doses: vomit, dysp, cyan, coarse pulm rales, liver damage	Eye: Skin: Breath: Swallow: Irrimed Soap wash prompt Resp support Medical attention immed	Resp sys, blood, liver
[ANTU]						
Skin: Eye: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam/Daily When wet or contam Daily Eyewash, Quick drench	NIOSH 4 SCBAF PD PP/SAF PD PP ASCBA Escape GMFAGHE/SCBAE	Inh Abs Con ing	Ulceration of nasal septum, derm. GI disturbances, perit neur, resp irrt, hyperpig of skin, [canc]	Eye: Skin: Breath: Swallow: Irrimed Soap wash immed Resp support Medical attention immed	Liver, kidneys, skin, lungs, lymphatic sys [lung & lymphatic cancer]
[Arsenic (inorganic compounds, as As)]						
Recommendations vary depending upon the specific compound.		TBAL	Inh ing Con	In animals: irrit skin, possible derm; resp distress; diarr; kidney damage; muscle tremor, seiz; possible GI tract, terato, repro effects; possible liver damage	Eye: Skin: Breath: Swallow: Irrimed Soap wash immed Resp support Medical attention immed	Skin, resp sys, kidneys, CNS, liver, GI tract, repro sys
[Arsenic (organic compounds, as As)]						
Skin: Eye: Wash skin: Remove: Change: Provide:	Frostbite Frostbite N.R. When wet (flam) N.R. Frostbite	NIOSH 4 SCBAF PD PP/SAF PD PP ASCBA Escape GMFS/SCBAE	Inh Con (liq)	Head, mal, weak, dizz, dysp, abdom, back pain, neu, vomit, bronch skin, hema, jaun, perit neur, liq; frostbite, [canc]	Eye: Skin: Breath: Frostbite Frostbite Resp support	Blood, kidneys, liver [lung & lymphatic cancer]
[Arsine]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide No.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL F.P. IP, Sp, Gr, Flammability	VP, FRZ UEL, LEL		
Asbestos Hydrated mineral silicates 1332-21-4 C16475000 2212 31 (blue) 2590 31 (white)	Actinolite, Actinolite asbestos, Amosite (cummingtonite- grunerite), Anthophyllite, Anthophyllite asbestos, Chrysotile, Crocidolite (Riebeckite), Tremolite, Tremolite asbestos	NIOSH Ca See Appendix A See Appendix C OSHA[1910 1001] [1910 1101] See Appendix C	Ca [N.D.]	White or greenish (chrysotile), blue (crocidolite), or gray-green (amosite); fibrous, odorless solids	MW: Varies BP: Decomposes Sol: Insoluble F.P. NA IP: NA Sp Gr: ? Noncombustible Solids	VP: 0 mm (approx.) MLT 1112°F (Decomposes) UEL: NA LEL: NA	None reported	Filter; Acetone/ Triacetin, PCM, II [#7400, Fibers] [Also #7402 (TEM).]
Asphalt fumes 8052-42-4 C19900000 1999 27 (Asphalt)	Asphalt; Asphaltum, Bitumen (European term), Petroleum asphalt, Petroleum bitumen, Road asphalt, Roofing asphalt	NIOSH Ca CS mg/m ³ [15-min] See Appendix A OSHA none	Ca [N.D.]	Fumes generated during the production or application of asphalt (a dark- brown to black cement-like sub- stance manufactured by the vacuum dis- tillation of crude petroleum oil).	Properties vary depending upon the specific asphalt formulation or mixture. Asphalt: Combustible Solid		None reported [Note: Asphalt becomes molten at about 200°F.]	Filter; none; Grav; NIOSH Asphalt Fumes Crit. Doc.
Atrazine C ₆ H ₉ ClN ₅ 1912-24-9 XY5800000 2763 56 (triazine pesticide)	2-Chloro-4-ethylamino-6- isopropylamino-s-triazine; 6-Chloro-N-ethyl-N'- (1-methylethyl)-1,3,5- triazine-2,4-diamine	NIOSH 5 mg/m ³ OSHA† none	N.D.	Colorless or white, odorless, crystalline powder. [herbicide]	MW: 215.7 BP: Decomposes Sol: 0.003% F.P. NA IP: NA Sp Gr: 1.19 Noncombustible Solid, but may be mixed with flammable liquids.	VP: 0.0000003 mm MLT: 340°F UEL: NA LEL: NA	Strong acids, strong bases	Filter; none; Grav; II [#0500, Nuisance Dust (total)]
Azinphos-methyl C ₈ H ₁₁ O ₃ PS ₂ N ₃ 86-50-0 TE1925000 2783 55	0,0-Dimethyl-S-4-oxo- 1,2,3-benzotriazin- 3(4H)-ylmethyl phosphor- dithioate, Guthion®, Methyl azinphos [(CH ₃) ₂ P(S) ₂ ISCH ₂ (N ₃ C ₄ H ₃ O)]	NIOSH/OSHA 0.2 mg/m ³ [skin]	10 mg/m ³	Colorless crystals or a brown, waxy solid [insecticide]	MW: 317.3 BP: Decomposes Sol: 0.003% F.P. NA IP: ? Sp Gr: 1.44 Noncombustible Solid	VP: 8 x 10 ⁻⁶ mm MLT 153°F UEL: NA LEL: NA	Strong oxidizers, acids	None available

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact Daily N.R. Daily	NIOSH § SCBAF:PD,PP/SAF:PD,PP ASCBA Escape: HiEF/SCBAE	Inh ing Con	Asbestosis (chronic exposure); dysp, interstitial fib, restricted pulm function, finger clubbing, Irrit eyes, [carc]	Eye: Breath: Immed Fresh air	Resp sys, eyes [lung cancer]
[Asbestos]						
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact Daily N.R. Daily	NIOSH § SCBAF:PD,PP/SAF:PD,PP ASCBA Escape: GMFOVHIE/SCBAE	Inh Abs Con	Irrit eyes, resp sys; [carc]	Eye: Breath: Immed Resp support	Eyes, resp sys [in animals: skin tumors]
[Asphalt fumes]						
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam Daily Eyewash, Quick drench	TBAL	Inh ing Con	Irrit eyes, skin; derm, sens skin; dysp, weak, inco, saliv; hypothermia; liver inj	Eye: Skin: Breath: Swallow: Immed Soap wash Immed Resp support Medical attention Immed	Eyes, skin, resp sys, CNS, liver
[Alzadine]						
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam Daily Quick drench	NIOSH/OSHA 2 mg/m ³ : CCROVDMFu/SA 5 mg/m ³ : SA CF/PAPROVDMFu 10 mg/m ³ : CCROVHIE/GMFOVHIE/ PAPRTOVHIE/SAT:CF/ SCBAF/SAF § SCBAF:PD,PP/SAF:PD,PP ASCBA Escape: GMFOVHIE/SCBAE	Inh Abs ing Con	Miosis, ache eyes, blurred vision, lac, rhin, head, tight chest, wheez, lar spas, saliv, cyan, anox, nau, vomit, diarr, sweat, twitch, para, convuls, low BP, card irreg	Eye: Skin: Breath: Swallow: Immed Soap wash Immed Resp support Medical attention Immed	Resp sys, CNS, CVS, blood chol

[Alzadine continued]

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL, F.P., IP, Sp, Gr, flammability	VP, FRZ, UEL, LEL		
Barium chloride (as Ba) BaCl ₂ 10361-37-2 CQ8750000	Barium dichloride	NIOSH/IOSHA* 0.5 mg/m ³ [Note: The REL and PEL also apply to other soluble barium compounds (as Ba) except Barium sulfate.]	50 mg/m ³ (as Ba)	White, odorless solid	MW: 208.2 BP: 2640°F SOL: 38% F.P.: NA IP: ?	VP: Low MLT: 1765°F UEL: NA LEL: NA	Acids, oxidizers	Filter; Water, AAS, III [#7056, Barium, soluble cmpds]
1564 33 (Barium compound, n.o.s.)					Sp Gr: 3.86 Noncombustible Solid			
Barium nitrate (as Ba) Ba(NO ₃) ₂ 10022-31-8 CQ9625000	Barium dinitrate, Barium(II) nitrate (1:2), Barium salt of nitric acid	NIOSH/IOSHA* 0.5 mg/m ³ [Note: The REL and PEL also apply to other soluble barium compounds (as Ba) except Barium sulfate.]	50 mg/m ³ (as Ba)	White, odorless solid	MW: 261.4 BP: Decomposes SOL: 3% F.P.: NA IP: ?	VP: Low MLT: 1094°F UEL: NA LEL: NA	Acids, oxidizers, aluminum-magnesium alloys, (barium dioxide + zinc) [Note: Contact with combustible material may cause fire.]	Filter; Water, AAS, III [#7056, Barium, soluble cmpds]
1446 42					Sp Gr: 3.24 Noncombustible Solid, but will accelerate the burning of combustible materials			
Barium sulfate BaSO ₄ 7727-43-7 CR0600000	Artificial barite, Barite, Barium salt of sulfuric acid, Barytes (natural)	NIOSH 10 mg/m ³ (total) 5 mg/m ³ (resp) OSHA† 15 mg/m ³ (total) 5 mg/m ³ (resp)	N.D.	White or yellowish, odorless powder.	MW: 233.4 BP: 2912°F (Decomposes) Sol(54°F): 0.0002% F.P.: NA IP: NA	VP: 0 mm (approx) MLT: 2876°F UEL: NA LEL: NA	Phosphorus, aluminum [Note: Aluminum in the presence of heat can cause an explosion.]	Filter; none; Grav; III [Nuisance Dust; #0500 (total), #0600 (resp)]
1564 55 (Barium compound, n.o.s.)					Sp.Gr: 4.25-4.5 Noncombustible Solid			
Banomyf C ₁₄ H ₁₆ N ₄ O ₄ 17804-35-2 DD6475000	Methyl 1-(butylcarbamoyl)-2-benzimidazolecarbamate	NIOSH See Appendix D OSHA† 15 mg/m ³ (total) 5 mg/m ³ (resp)	N.D.	White crystalline solid with a faint, acid odor, [fungicide] [Note: Decomposes without melting above 572°F.]	MW: 290.4 BP: Decomposes Sol: 0.0004% F.P.: NA IP: NA	VP: <0.0001 mm MLT: >572°F (Decomposes) UEL: NA LEL: NA	Heat, strong acids, strong alkalis	Filter; none; Grav; III [Nuisance Dust; #0500 (total), #0600 (resp)]
2757 55 (carbamate pesticide, n.o.s.)					Sp.Gr: ? Noncombustible Solid			

Personal protection and sanitation (See Table 3)	Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
		Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
[Azinphos-methyl]					
Skin: Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin, upper	Eye:	Eyes, skin, resp sys,
Eyes: Prevent eye contact	5 mg/m ³ : DMXQ/SA	ing	resp sys; skin burns,	Skin:	heart, CNS
Wash skin: When contam	12.5 mg/m ³ : SA: CF/PAPRDM	Con	gastroenteritis; musc	Breath:	
Remove: When wet or contam	25 mg/m ³ : HIEF/SAT: CF/PAPRTHIE/ SCBAF/SAF		spasm; slow pulse, extrastokes; hypokalemia	Swallow:	
Change: Daily	50 mg/m ³ : SAF: PD, PP §: SCBAF: PD, PP/SAF: PD, PP: ASCBA Escape: HIEF/SCBAE				
[Barium chloride (as Ba)]					
Skin: Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin, upper	Eye:	Eyes, skin, resp sys,
Eyes: Prevent eye contact	5 mg/m ³ : DMXQ/SA	ing	resp sys; skin burns,	Skin:	heart, CNS
Wash skin: When contam	12.5 mg/m ³ : SA: CF/PAPRDM	Con	gastroenteritis; musc	Breath:	
Remove: When wet or contam	25 mg/m ³ : HIEF/SAT: CF/PAPRTHIE/ SCBAF/SAF		spasm; slow pulse, extrastokes; hypokalemia	Swallow:	
Change: Daily	50 mg/m ³ : SAF: PD, PP §: SCBAF: PD, PP/SAF: PD, PP: ASCBA Escape: HIEF/SCBAE				
[Barium nitrate (as Ba)]					
Skin: Prevent skin contact	TBAL	Inh	Irrit eyes, nose, upper	Eye:	Eyes, resp sys
Eyes: Prevent eye contact		Con	resp sys; benign pneumoconiosis (baritosis)	Skin:	
Wash skin: Daily				Breath:	
Remove: N.R.				Swallow:	
Change: N.R.					
Provide: Eyewash, Quick drench					
[Barium sulfate]					
Skin: Prevent skin contact	TBAL	Inh	Irrit eyes, skin, upper	Eye:	Eyes, skin, resp sys,
Eyes: Prevent eye contact		ing	resp sys; skin sens;	Skin:	repro sys
Wash skin: When contam		Con	possible repro, terato effects	Breath:	
Remove: When wet or contam				Swallow:	
Change: Daily					
Provide: Eyewash, Quick drench					
[Benomyl]					

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P., IP, Sp. Gr., flammability	VP, FRZ UEL, LEL		
Benzene C_6H_6 71-43-2 CY1400000	Benzol, Phenyl hydride	NIOSH Ca 0.1 ppm ST 1 ppm See Appendix A OSHA[1910.1026] 1 ppm ST 5 ppm See Appendix F	Ca [500 ppm]	Colorless; to light-yellow liquid with an aromatic odor [Note: A solid below 42°F.]	MW 78.1 BP 176°F Sol: 0.07% Fl.P. 12°F IP 9.24 eV	VP 75 mm FRZ 42°F UEL 7.8% LEL 1.2%	Strong oxidizers, many fluorides & perchlorates, nitric acid	Chir, CS, GC/FID, IR [#1500, Hydro- carbons] [Also #3700.]
1114 27	1 ppm = 3.25 mg/m ³				Sp. Gr. 0.88 Class IB Flammable Liquid			
Benzenethiol C_6H_5SH 108-98-5 DC9525000	Mercaptobenzene, Phenylmercaptan, Thiophenol	NIOSH 0.1 ppm (0.5 mg/m ³) [15-min] OSHA† none	N.D.	Water-white liquid with an offensive, garlic-like odor. [Note: A solid below 5°F.]	MW 110.2 BP 336°F Sol(77°F): 0.08% Fl.P: 132°F IP: 8.33 eV	VP(65°F): 1 mm FRZ: 5°F UEL: ? LEL: ?	Strong acids & bases, calcium hypochlorite, alkali metals [Note: Oxidizes on exposure to air.]	None available
2337 57	1 ppm = 4.58 mg/m ³				Sp. Gr: 1.08 Class II Combustible Liquid			
Benzidine $NH_2C_6H_4C_6H_4NH_2$ 92-87-5 DC9625000	Benzidine-based dyes, 4,4'-Bianiline, 4,4'-Biphenyldiamine, 1,1'-Biphenyl-4,4'-diamine, 4,4'-Diaminobiphenyl, p-Diaminodiphenyl [Note: Benzidine has been used as a basis for many dyes.]	NIOSH Ca See Appendix A See Appendix C OSHA[1910.1010] See Appendix B See Appendix C	Ca [N.D.]	Grayish-yellow, reddish-gray, or white crystalline powder [Note: Darkens on exposure to air and light.]	MW 184.3 BP 752°F Sol(54°F): 0.04% Fl.P. ? IP ?	VP Low MLT 239°F UEL ? LEL ?	Red fuming nitric acid	Filter/ Sigel Reagent, HPLC/UVD, IR [#5509]
1885 53					Sp. Gr 1.25 Combustible Solid, but difficult to burn.			
Benzoyl peroxide $(C_6H_5CO)_2O_2$ 94-36-0 DM8575000	Benzoylperoxide, Dibenzoyl peroxide	NIOSH/OSHA 5 mg/m ³	1500 mg/m ³	Colorless to white crystals or a granular powder with a faint, benzaldehyde-like odor	MW 242.2 BP: Decomposes explosively Sol <1% Fl.P 178°F IP ?	VP <1 mm MLT 217°F UEL ? LEL ?	Combustible substances (wood, paper, etc.), acids, alkalis, alcohols, amines, ethers [Note: Containers may explode when heated. Extremely explosion-sensitive to shock, heat, and friction.]	Filter; Diethyl ether; HPLC/UVD; IR [#5009]
2085/2086/2087 49 2088/2089/2090 49					Sp. Gr 1.33 Combustible Solid (easily ignited and burns very rapidly)			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	Prevent skin contact	NIOSH	Inh	Irritates skin, nose,	Eye	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	§ SCBAF PD PP/SAF PD PP ASCBA	Abs	resp sys, dizziness, head, nau,	Skin	blood, CNS, bone
Wash skin:	When contam	Escape: GMFOV/SCBAE	Ing	staggered gait, fatigue, anor,	Breath	marrow
Remove:	When wet (flamm)		Con	lass, derm, bone marrow	Swallow	[Leukemia]
Change:	N.R.			depress. [carc]		
Provide:	Eyewash, Quick drench					
[Benzene]						
Skin:	Prevent skin contact	NIOSH	Inh	Irritates skin, resp sys;	Eye:	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	1 ppm: CCROV/SA	Abs	derm; cyan; cough, wheez,	Skin:	CNS, kidneys, liver,
Wash skin:	When contam	2.5 ppm: SA, CF/PAPROV	Ing	dysp, pulm edema, pneumonia;	Breath:	spleen
Remove:	When wet or contam	5 ppm: CCRFOV/GMFOV/PAPRTOV/	Con	head, dizziness, CNS depress;	Swallow:	
Change:	N.R.	SCBAF/SAF		nau, vomit; kidney, liver,		
Provide:	Eyewash, Quick drench	§: SCBAF PD PP/SAF PD PP ASCBA		spleen damage		
		Escape: GMFOV/SCBAE				
[Benzeneethiol]						
Skin:	Prevent skin contact	NIOSH	Inh	Hema: secondary anemia	Eye	Bladder, skin,
Eyes:	Prevent eye contact	§ SCBAF PD PP/SAF PD PP ASCBA	Abs	from hemolysis, acute	Skin	kidneys, liver,
Wash skin:	When contam/Daily	Escape: HIEF/SCBAE	Ing	cystitis, acute liver	Breath	blood
Remove:	When wet or contam		Con	disorders, derm. painful;	Swallow	[liver, kidney &
Change:	Daily			irreg. urination. [carc]		bladder cancer]
Provide:	Eyewash, Quick drench					
[Benzidine]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irritates skin, muc	Eye	Eyes, skin, resp sys
Eyes:	Prevent eye contact	50 mg/m ³ DMXSO ² /SA*	Ing	memb. sens. derm	Skin	
Wash skin:	When contam	125 mg/m ³ SA CF*/PAPRDM*	Con		Breath:	Soap wash prompt
Remove:	When wet or contam	250 mg/m ³ HIEF/PAPRTHIE*/SCBAF/			Swallow	Resp support
Change:	Daily	SAF				Medical attention
		1500 mg/m ³ SAF PD PP				immed
		§ SCBAF PD PP/SAF PD PP ASCBA				
		Escape: HIEF/SCBAE				

[Benzyl peroxide]

Chemical name, structure formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWI, unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Benzyl chloride $C_6H_5CH_2Cl$ 100-44-7 X58925000	Chloromethylbenzene, α -Chlorotoluene	NIOSH C 1 ppm (5 mg/m ³) [15-min] OSHA 1 ppm (5 mg/m ³)	10 ppm	Colorless to slightly yellow liquid with a pungent, aromatic odor.	MW 126.6 BP 354°F Sol 0.05% FLP 153°F IP ?	VP 1 mm FRZ -38°F UEL ? LEL 1.1%	Oxidizers, acids, copper, aluminum, magnesium, iron, zinc, tin [Note: Can polymerize when in contact with all common metals except nickel & lead. Hydrolyzes in H ₂ O to benzyl alcohol.]	Char. CS, GC/MS, II [#1003, Halo- genated Hydro- carbons]
1738 59	1 ppm = 5.26 mg/m ³				Sp Gr 1.10 Class IIIA Combustible Liquid			
Beryllium & beryllium compounds (as Be) Be (Metal) 7440-41-7 (Metal) DS1750000 (Metal) 1566 53 (compounds) 1567 32 (powder)	Beryllium metal. Beryllium Other synonyms vary depending upon the specific beryllium compound.	NIOSH Ca Not to exceed 0.0005 mg/m ³ See Appendix A OSHA 0.002 mg/m ³ C 0.005 mg/m ³ 0.025 mg/m ³ [30-min maximum peak]	Ca [4 mg/m ³ (as Be)]	Metal. A hard, brittle, gray- white solid.	MW 9.0 BP 4532°F Sol: Insoluble FLP: NA IP: NA	VP 0 mm (approx) MLT: 2349°F UEL: NA LEL: NA	Acids, caustics, chlorinated hydro- carbons, oxidizers, molten lithium	Filter; Acid; AAS/GF, II [#1102]
					Sp Gr 1.65 (Metal) Metal: Noncombustible Solid in bulk form, but a slight explosion hazard in the form of a powder or dust.			
Bismuth telluride, doped with Selenium sulfide (as Bi ₂ Te ₃)	Doped bismuth sesquioxide, Doped bismuth telluride, Doped bismuth tritelluride, Doped tellurobismuthite [Note: Doped with selenium sulfide. Commercial mix may contain 80% Bi ₂ Te ₃ , 20% stannous telluride, plus some tellurium.]	NIOSH 5 mg/m ³ OSHA† none	N.D.	Gray, crystalline solid that has been enhanced (doped) with a small amount of selenium sulfide (SeS). [Note: Doping alters the conductivity of a semiconductor.]	Properties are unavailable but should be similar to Bismuth telluride, undoped. Sp Gr: ? Noncombustible Solid		Strong oxidizers, moisture	Filter; none; Grav; II [#0500, Nuisance Dust (total)]
Bismuth telluride, undoped Bi ₂ Te ₃ 1304-82-1 EB3110000	Bismuth sesquioxide, Bismuth telluride, Bismuth tritelluride, Tellurobismuthite	NIOSH 10 mg/m ³ (total) 5 mg/m ³ (resp) OSHA 15 mg/m ³ (total) 5 mg/m ³ (resp)	N.D.	Gray, crystalline solid.	MW: 800.8 BP: ? Sol: Insoluble FLP: NA IP: NA	VP: 0 mm (approx) MLT: 1063°F UEL: NA LEL: NA	Strong oxidizers (e.g., bromine, chlorine, or fluorine), moisture, nitric acid (decomposes)	Filter; none; Grav; II [Nuisance Dust: #0500 (total), #0600 (resp)]

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection -- maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)		First aid (See Table 6)	Target organs (See Table 6)
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin, nose,	Eye	Irr: Immed	Eyes, skin, resp sys.
Eyes:	Prevent eye contact	10 ppm: CCROVAG*/GMFOVAG/	Ing	weak, irrit, head, skin	Skin	Soap wash immed	CNS
Wash skin:	When contam	PAPROVAG*/SA*/SCBAF	Con	eruption, pulm edema	Breath:	Resp support	
Remove:	When wet or contam	§ SCBAF PD PP/SAF PD PP ASCBA			Swallow	Medical attention immed	
Change:	N.R.	Escape: GMFOVAG/SCBAE					
Provide:	Eyewash, Quick drench						
[Benzyl chloride]							
Skin:	Prevent skin contact	NIOSH	Inh	Berylliosis (chronic	Eye	Irr: Immed	Eyes, skin, resp sys
Eyes:	Prevent eye contact	§ SCBAF PD PP/SAF PD PP ASCBA	Con	exposure): anor, low-wght,	Breath:	Fresh air	[lung cancer]
Wash skin:	Daily	Escape: HEF/SCBAE		weak, chest pain, cough,			
Remove:	When wet or contam			clubbing of fingers, cyan,			
Change:	Daily			pulm insufficiency; irrit			
Provide:	Eyewash			eyes; derm; [canc]			
[Beryllium & beryllium compounds (as Be)]							
Skin:	Prevent skin contact	TBAL	Inh	Irrit eyes, skin, upper	Eye:	Irr: Immed	Eyes, skin, resp sys
Eyes:	Prevent eye contact		Con	resp sys; garlic breath;	Skin:	Soap wash immed	
Wash skin:	When contam			In animals: pulm lesions	Breath:	Resp support	
Remove:	When wet or contam			(nonfibrotic)	Swallow:	Medical attention immed	
Change:	N.R.						
Provide:	Eyewash, Quick drench						
[Bismuth telluride, doped with Selenium sulfide (as Bi, Te, S)]							
Skin:	Prevent skin contact	TBAL	Inh	Irrit eyes, skin, upper	Eye:	Irr: Immed	Eyes, skin, resp sys
Eyes:	Prevent eye contact		Con	resp sys; garlic breath	Skin:	Soap wash immed	
Wash skin:	When contam				Breath:	Resp support	
Remove:	When wet or contam				Swallow:	Medical attention immed	
Change:	N.R.						
Provide:	Eyewash, Quick drench						
[Bismuth telluride, undoped]							

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL F.P., IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Borates, tetra, sodium salts (Anhydrous) $\text{Na}_2\text{B}_4\text{O}_7$ 1330-43-4 E04588000	Anhydrous borax, Borax dehydrated, Disodium salt of boric acid, Disodium tetraborate, Fused borax, Sodium borate (anhydrous), Sodium tetraborate	NIOSH 1 mg/m ³ OSHA† none	N.D.	White to gray, odorless powder, [herbicide] [Note: Becomes opaque on exposure to air.]	MW: 201.2 BP: 2867°F (Decomposes) Sol: 3% F.P.: NA IP: NA Sp.Gr: 2.37 Noncombustible Solid	VP: 0 mm (approx) MLT: 1365°F UEL: NA LEL: NA	Moisture [Note: Forms partial hydrate in moist air.]	Filter; none; Grav; III [#0500, Nuisance Dust (total)]
Borates, tetra, sodium salts (Decahydrate) $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$ 1303-96-4 VZ2278000	Borax, Borax decahydrate, Sodium borate decahydrate, Sodium tetraborate decahydrate	NIOSH 5 mg/m ³ OSHA† none	N.D.	White, odorless, crystalline solid, [herbicide] [Note: Becomes anhydrous at 608°F.]	MW: 381.4 BP: 608°F Sol: 6% F.P.: NA IP: NA Sp.Gr: 1.73 Noncombustible Solid (an inherent fire retardant).	VP: 0 mm (approx) MLT: 167°F UEL: NA LEL: NA	Zirconium, strong acids, metallic salts	Filter; none; Grav; III [#0500, Nuisance Dust (total)]
Borates, tetra, sodium salts (Pentahydrate) $\text{Na}_2\text{B}_4\text{O}_7 \cdot 5\text{H}_2\text{O}$ 12179-04-3	Borax pentahydrate, Sodium borate pentahydrate, Sodium tetraborate pentahydrate	NIOSH 1 mg/m ³ OSHA† none	N.D.	Colorless or white, odorless crystals or free-flowing powder, [herbicide] [Note: Begins to lose water of hydration at 252°F.]	MW: 291.4 BP: ? Sol: 4% F.P.: NA IP: NA Sp.Gr: 1.82 Noncombustible Solid	VP: 0 mm (approx) MLT: 392°F UEL: NA LEL: NA	None reported [Note: However, see the reactivities & incompatibilities reported for the related substance Borax decahydrate above.]	Filter; none; Grav; III [#0500, Nuisance Dust (total)]
Boron oxide B_2O_3 1303-85-2 E07900000	Boric anhydride, Boric oxide, Boron trioxide	NIOSH 10 mg/m ³ OSHA† 15 mg/m ³	2000 mg/m ³	Colorless semi- transparent lumps or hard, white odorless crystals	MW: 69.6 BP: 3380°F Sol: 3% F.P.: NA IP: 13.50 eV Sp.Gr: 2.46 Noncombustible Solid	VP: 0 mm (approx) MLT: 842°F UEL: NA LEL: NA	Water [Note: Reacts slowly with water to form boric acid.]	Filter; none; Grav, III [#0500, Nuisance Dust (total)]

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)		Target organs (See Table 5)
Skin:	N.R.	TBAL	Inh Ing Con	Irrit eyes, skin, upper resp sys; dermat; epist; cough, dysp	Eye: Skin: Breath: Swallow:	Irrigated Soap wash Resp support Medical attention Irrigated	Eyes, skin, resp sys
Eyes:	N.R.						
Wash skin:	Daily						
Remove:	N.R.						
Change:	Daily						
[Borates, tetra sodium salts (Anhydrous)]							
Skin:	N.R.	TBAL	Inh Ing Con	Irrit eyes, skin, upper resp sys; dermat; epist; cough, dysp	Eye: Skin: Breath: Swallow:	Irrigated Soap wash Resp support Medical attention Irrigated	Eyes, skin, resp sys
Eyes:	N.R.						
Wash skin:	Daily						
Remove:	N.R.						
Change:	Daily						
[Borates, tetra sodium salts (Decahydrate)]							
Skin:	N.R.	TBAL	Inh Ing Con	Irrit eyes, skin, upper resp sys; dermat; epist; cough, dysp	Eye: Skin: Breath: Swallow:	Irrigated Soap wash Resp support Medical attention Irrigated	Eyes, skin, resp sys
Eyes:	N.R.						
Wash skin:	Daily						
Remove:	N.R.						
Change:	Daily						
[Borates, tetra sodium salts (Pentahydrate)]							
Skin:	Prevent skin contact	NIOSH	Inh Ing Con	Irrit eyes, skin, resp sys; cough; conj; skin eryt	Eye Skin Breath. Swallow:	Irrigated Water flush prompt Fresh air Medical attention Irrigated	Eyes, skin, resp sys
Eyes:	Prevent eye contact	50 mg/m ³ DM*					
Wash skin:	When contam	100 mg/m ³ DMXSG**/SA*					
Remove:	When wet or contam	250 mg/m ³ SA CF*/PAPRDM**					
Change:	N.R.	500 mg/m ³ HIEF/PAPRTHIE/SCBAF/ SAF					
		2000 mg/m ³ : SAF/PD, PP					
		5: SCBAF PD PP/SAF PD, PP ASCBA					
		Escape: HIEF/SCBAE					
[Boron oxide]							

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P., IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Boron tribromide BBr_3 10294-33-4 ED7400000	Boron bromide, Tribromoborane	NIOSH C 1 ppm (10 mg/m ³) OSHA† none	N.D.	Colorless, fuming liquid with a sharp, irritating odor.	MW: 250.5 BP: 194°F Sol: Decomposes Fl.P.: NA IP: 8.70 eV	VP(57°F): 40 mm FRZ: -81°F UEL: NA LEL: NA	Moisture, water, heat, potassium, sodium, alcohols [Note: Attacks metals, wood & rubber. Reacts with water to form boric acid and hydrogen bromide.]	None available
2682 58	1 ppm = 10.41 mg/m ³				Sp.Gr(55°F): 2.84 Noncombustible Liquid			
Boron trifluoride BF_3 7637-07-2 ED2275000	Boron fluoride, Trifluoroborane	NIOSH/OSHA C 1 ppm (3 mg/m ³)	25 ppm	Colorless gas with a pungent, suffocating odor [Note: Forms dense white fumes in moist air Shipped as a nonpressurized compressed gas.]	MW: 67.8 BP: -148°F Sol: 100% (in cold H ₂ O) Fl.P.: NA IP: 15.50 eV	VP: >50 atm FRZ: -196°F UEL: NA LEL: NA	Alkali metals, calcium oxide [Note: Hydrolyzes in moist air or hot water to form boric acid, hydrogen fluoride & fluoboric acid.]	None available
1006 15	1 ppm = 2.82 mg/m ³				RGasD: 2.38 Nonflammable Gas			
Bromacil $\text{C}_8\text{H}_8\text{BrN}_2\text{O}_2$ 314-40-8 YQ9100000	5-Bromo-3-sec-butyl-6-methyluracil, 5-Bromo-6-methyl-3-(1-methylpropyl)uracil	NIOSH 1 ppm (10 mg/m ³) OSHA† none	N.D.	Odorless, colorless to white, crystalline solid. [herbicide] [Note: Commercially available as a wettable powder or in liquid formulations.]	MW: 261.2 BP: Sublimes Sol(77°F): 0.08% Fl.P.: NA IP: 7	VP(212°F): 0.0008 mm MLT: 317°F (Sublimes) UEL: NA LEL: NA	Strong acids (decomposes slowly), oxidizers, heat, sparks, open flames	Filter; none; Grav; III [#0500, Nuisance Dust (total)]
	1 ppm = 10.86 mg/m ³				Sp.Gr: 1.55 Noncombustible Solid, but may be dissolved in flammable liquids.			
Bromine Br_2 7726-95-6 EF9100000	Molecular bromine	NIOSH 0.1 ppm (0.7 mg/m ³) ST 0.3 ppm (2 mg/m ³) OSHA† 0.1 ppm (0.7 mg/m ³)	3 ppm	Dark reddish-brown, fuming liquid with suffocating, irritating fumes	MW 159.8 BP 139°F Sol 4% Fl.P. NA IP 10.55 eV	VP 172 mm FRZ 19°F UEL NA LEL NA	Combustible organics (sawdust, wood, cotton, straw, etc.), aluminum readily oxidizable materials, ammonia, hydrogen, acetylene, phosphorus, potassium, sodium [Note: Corrodes iron, steel, stainless steel & copper.]	Filter; Na, S, O ₂ ; IC; III [#0011]
1744 59	1 ppm = 6.54 mg/m ³				Sp.Gr 3.12 Noncombustible Liquid, but accelerates the burning of combustibles.			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)	
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R. Eyewash, Quick drench	TBAL	Inh ing Con	Irrite eyes, skin, resp sys; skin, eye burns; dysp, pulm edema	Eye: Skin: Breath: Swallow: Irrimed Water flush immed Resp support Medical attention immed	Eyes, skin, resp sys	
[Boron tribromide]							
Skin: Eyes: Wash skin: Remove: Change:	N.R. N.R. N.R. N.R. N.R.	NIOSH/OSHA 10 ppm: SA* 25 ppm: SA:CF*/SCBAF/SAF § SCBAF PD, PP/SAF PD, PP/ASCBA Escape: GMFS/SCBAE	Inh Con	Irrit eyes, skin, nose, resp sys; epis, eye, skin burns, in animals: pneu, kidney damage	Eye Skin Breath: Water flush immed Resp support	Eyes, skin, resp sys, kidneys	
[Boron trifluoride]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contain Daily Eyewash, Quick drench	TBAL	Inh ing Con	Irrite eyes, skin, upper resp sys; in animals: thyroid inj	Eye: Skin: Breath: Swallow: Irrimed Soap wash immed Resp support Medical attention immed	Eyes, skin, resp sys, thyroid	
[Bromacil]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R. Eyewash, Quick drench	NIOSH/OSHA 2.5 ppm: SA, CF*/PAPRS* 3 ppm: CCRFS*/GMFS*/PAPRTS*// § SCBAF/SAF § SCBAF PD, PP/SAF PD, PP/ASCBA Escape: GMFS/SCBAE	Inh ing Con	Dizz, head, lac, epis, cough, feeling of oppression, pulm edema, pneu, abdom pain, diarr, measle-like eruptions, eye, skin burns	Eye Skin Breath Swallow Irrimed Soap wash immed Resp support Medical attention immed	Resp sys, eyes, CNS, skin	
[Bromine]							

Chemical name, structure formula, CAS and RTECS Nos., and DOT ID and guide No.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL, F.P., IP, Sp. Gr., Flammability	VP, FRZ, UEL, LEL		
Bromine pentafluoride BrF₅ 7789-30-2 EF9350000	Bromine fluoride	NIOSH 0.1 ppm (0.7 mg/m ³) OSHA† none	N.D.	Colorless to pale-yellow, fuming liquid with a pungent odor. [Note: A colorless gas above 105°F. Shipped as a compressed gas.]	MW: 174.9 BP: 105°F Sol: Reacts violently F.P.: NA IP: 7	VP: 328 mm FRZ: -77°F UEL: NA LEL: NA	Acids, halogens, arsenic, selenium, sulfur, glass, organic materials, water [Note: Reacts with all elements except inert gases, nitrogen & oxygen.]	None available
1745 44	1 ppm = 7.27 mg/m ³				Sp. Gr: 2.48 Noncombustible Liquid, but a very powerful oxidizer.			
Bromoform CHBr₃ 75-25-2 PB5600000	Methyl tribromide, Tribromomethane	NIOSH/OSHA 0.5 ppm (5 mg/m ³) [skin]	850 ppm	Colorless to yellow liquid with a chloroform-like odor. [Note: A solid below 47°F.]	MW: 252.8 BP: 301°F Sol: 0.1% F.P.: NA IP: 10.48 eV	VP: 5 mm FRZ: 47°F UEL: NA LEL: NA	Lithium, sodium, potassium, calcium, aluminum, zinc, magnesium, strong caustics, acetone [Note: Gradually decomposes, acquiring yellow color, air & light accelerate decomposition.]	Char, CS, GC/FID, III [#1003, Halogenated Hydrocarbons]
2515 58	1 ppm = 10.51 mg/m ³				Sp. Gr: 2.89 Noncombustible Liquid			
1,3-Butadiene CH₂=CHCH=CH₂ 106-99-0 E19275000	Butethene, Biviny, Butadiene, Divinyl, Erythrene, Vinylethylene	NIOSH Ca See Appendix A OSHA 1000 ppm (2200 mg/m ³)	Ca [2000 ppm] [UEL]	Colorless gas with a mild aromatic or gasoline-like odor. [Note: A liquid below 24°F. Shipped as a liquefied compressed gas.]	MW: 54.1 BP: 24°F Sol: Insoluble F.P.: NA (Gas) -105°F (Liq) IP: 9.07 eV RGasD: 1.68 Sp. Gr: 0.65 (Liquid at 21°F) Flammable Gas Class IA Flammable Liquid	VP: 2.4 atm FRZ: -164°F UEL: 12.0% LEL: 2.0%	Phenol, chlorine dioxide, copper, crotonaldehyde [Note: May contain inhibitors (such as tributylcatechol) to prevent self-polymerization. May form explosive peroxides upon exposure to air.]	Char(2), CH, CL, GC/FID, III [#1024]
1010 17 (inhibited)	1 ppm = 2.25 mg/m ³							
n-Butane CH₃CH₂CH₂CH₃ 106-97-8 EJ4200000	normal-Butane, Butylhydride, Diethyl, Methylmethylmethane [Note: Also see specific listing for isobutane.]	NIOSH 800 ppm (1900 mg/m ³) OSHA† none	N.D.	Colorless gas with a gasoline-like or natural gas odor. [Note: Shipped as a liquefied compressed gas. A liquid below 31°F.]	MW: 58.1 BP: 31°F Sol: Soluble F.P.: NA (Gas) IP: 10.63 eV RGasD: 2.11 Sp. Gr: 0.6 (Liquid at 31°F) Flammable Gas Class IA Flammable Liquid	VP: 2.05 atm FRZ: 217°F UEL: 8.4% LEL: 1.6%	Strong oxidizers (e.g., nitrates & perchlorates), chlorine, fluorine, (nickel carbonyl + oxygen)	None available
1011 22	1 ppm = 2.42 mg/m ³							

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	Prevent skin contact	TBAL	Inh	Irrit eyes, skin, resp	Eye:	Eyes, skin, resp sys,
Eyes:	Prevent eye contact		Ing	sys; com nec; skin	Skin:	liver, kidneys
Wash skin:	When contam		Con	burns; cough, dysp, pulm edema; liver, kidney inj	Breath:	
Remove:	When wet or contam				Swallow:	
Change:	N.R.					
Provide:	Eyewash, Quick drench					
[Bromine pentafluoride]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin resp	Eye:	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	12.5 ppm: SA CF/PAPROV ⁴	Abs	sys; CNS depres, liver,	Skin:	CNS, liver, kidneys
Wash skin:	When contam	25 ppm: CCRFOV/GMFOV/PAPRTOV ⁴	Ing	kidney damage	Breath:	
Remove:	When wet or contam	SCBAF/SAF	Con		Swallow:	
Change:	N.R.	850 ppm: SAF; PD, PP				
		§ SCBAF PD PP/SAF PD PP ASCBA				
		Escape: GMFOV/SCBAE				
[Bromoforn]						
Skin:	Frostbite	NIOSH	Inh	Irrit eyes, nose,	Eye:	Eyes, resp sys
Eyes:	Frostbite	§ SCBAF PD PP/SAF PD, PP ASCBA	Con	throat, drow, li-head,	Skin:	CNS, repro sys
Wash skin:	N.R.	Escape: GMFS/SCBAE	(liq)	liq; frostbite, terato,	Breath:	(hemato cancer)
Remove:	When wet (flamm)			repro effects; [carc]		
Change:	N.R.					
Provide:	Frostbite					
[1,3-Butadiene]						
Skin:	Frostbite	TBAL	Inh	Drow, narco, asphy;	Eye:	CNS
Eyes:	Frostbite		Con	liq; frostbite	Skin:	
Wash skin:	N.R.		(liq)		Breath:	
Remove:	When wet (flamm)					
Change:	N.R.					
Provide:	Frostbite					
[n-Butane]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL, FLP, IP, Sp. Gr., flammability	VP, FRZ UEL, LEL		
2-Butanone <chem>CH3COCH2CH3</chem> 78-93-3 EL6475000	Ethyl methyl ketone, MEK, Methyl acetone, Methyl ethyl ketone	NIOSH 200 ppm (590 mg/m ³) ST 300 ppm (885 mg/m ³) OSHA† 200 ppm (580 mg/m ³)	3000 ppm	Colorless liquid with a moderately sharp, fragrant, mint- or acetone- like odor.	MW 72.1 BP 175°F Sol 28% FLP 16°F IP 9.54 eV	VP: 78 mm FRZ -123°F UEL(200°F): 114% LEL(200°F): 14%	Strong oxidizers, amines, ammonia, inorganic acids, caustics, copper, isocyanates, pyridines	Ambersorb, CS, GC/FID, III [#2500]
1193 26 1232 26	1 ppm = 3.00 mg/m ³				Sp Gr 0.81 Class IB Flammable Liquid			
2-Butoxyethanol <chem>C4H9OCH2CH2OH</chem> 111-76-2 KJ8575000	Butyl Cellosolve®, Butyl oxido, Dowanol EB, EGBE, Ektasolve EB, Ethylene glycol monobutyl ether, Jeffersol EB	NIOSH 5 ppm (24 mg/m ³) [skin] OSHA† 50 ppm (240 mg/m ³) [skin]	700 ppm	Colorless liquid with a mild, ether-like odor.	AAW 118.2 BP 339°F Sol Miscible FLP 143°F IP: 10.00 eV	VP 0.8 mm FRZ -107°F UEL(275°F): 127% LEL(200°F): 1%	Strong oxidizers, strong caustics	Char, Methanol/ CH ₃ Cl, GC/FID, III [#1403, Alcohols IV]
2369 26	1 ppm = 4.91 mg/m ³				Sp Gr 0.90 Class IIIA Combustible Liquid			
2-Butoxyethanol acetate <chem>C4H9O(CH2)2OCOCH3</chem> 112-67-2 KJ5925000	2-Butoxyethyl acetate, Butyl Cellosolve® acetate, Butyl glycol acetate, EGBEA, Ektasolve EB® acetate, Ethylene glycol monobutyl ether acetate	NIOSH 5 ppm (13 mg/m ³) OSHA none	N.D.	Colorless liquid with a pleasant, sweet, fruity odor.	MW: 160.2 BP: 378°F Sol: 15% FLP: 71°F IP: ?	VP: 0.3 mm FRZ: -82°F UEL(275°F): 0.88% LEL(200°F): 8.54%	Oxidizers	Char, CH ₃ Cl/ Methanol; GC/FID; OSHA [#83]
	1 ppm = 6.86 mg/m ³				Sp.Gr: 0.94 Class IB Flammable Liquid			
n-Butyl acetate <chem>CH3COO(CH2)3CH3</chem> 123-86-4 AF7350000	Butyl acetate, n-Butyl ester of acetic acid, Butyl ethanoate	NIOSH 150 ppm (710 mg/m ³) ST 200 ppm (950 mg/m ³) OSHA† 150 ppm (710 mg/m ³)	1700 ppm [UEL]	Colorless liquid with a fruity odor	AAW 116.2 BP 258°F Sol 1% FLP 72°F IP 10.00 eV	VP 10 mm FRZ -107°F UEL 7.6% LEL 17%	Nitrates strong oxidizers, alkalis & acids	Char, CS, GC/FID, III [#1450, Esters I]
1123 26	1 ppm = 4.83 mg/m ³				Sp Gr 0.88 Class IB Flammable Liquid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Routes	Symptoms (See Table 5)	First aid (See Table 6)		Target organs (See Table 5)
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin, nose;	Eye	Irritated	Eyes, skin, resp sys.
Eyes:	Prevent eye contact	3000 ppm: SA:CF*/PAPROV*/	Ing	head, dizz, vomit, derm	Skin	Water wash immed	CNS
Wash skin:	When contam	CCRFOV/GMFOV/SCBAF/	Con		Breath:	Fresh air	
Remove:	When wet (flam)	SAF			Swallow	Medical attention immed	
Change:	N.R.	§ SCBAF PD PP/SAF PD PP ASCBA					
Provide:	Eyewash	Escape GMFOV/SCBAE					
(2-Butanone)							
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, skin, nose,	Eye	Irritated	Eyes, skin, resp sys.
Eyes:	Prevent eye contact	50 ppm: CCROV*/SA*	Abs	throat, hemolysis, hemog.	Skin	Soap wash prompt	CNS, hemato sys,
Wash skin:	When contam	125 ppm: SA:CF*/PAPROV*	Ing	CNS depres, head; vomit	Breath:	Resp support	blood, kidneys,
Remove:	When wet or contam	250 ppm: CCRFOV/GMFOV/PAPRTOV*/	Con		Swallow	Medical attention immed	liver, lymphoid sys
Change:	N.R.	SCBAF/SAF					
Provide:	Quick drench	700 ppm: SAF PD PP					
		§ SCBAF PD PP/SAF PD PP ASCBA					
		Escape GMFOV/SCBAE					
(2-Butoxyethanol)							
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, skin, nose,	Eye:	Irritated	Eyes, skin, resp sys.
Eyes:	Prevent eye contact	50 ppm: CCROV*/SA*	Abs	throat; hemolysis, hemog;	Skin:	Soap wash prompt	CNS, hemato sys,
Wash skin:	When contam	125 ppm: SA:CF*/PAPROV*	Ing	CNS depres, head; vomit	Breath:	Resp support	blood, kidneys,
Remove:	When wet (flam)	250 ppm: CCRFOV/GMFOV/PAPRTOV*/	Con		Swallow	Medical attention immed	liver, lymphoid sys
Change:	N.R.	SCBAF/SAF					
		700 ppm: SAF PD PP					
		§ SCBAF PD PP/SAF PD PP ASCBA					
		Escape GMFOV/SCBAE					
(2-Butoxyethanol acetate)							
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin, upper	Eye:	Irritated	Eyes, skin, resp sys.
Eyes:	Prevent eye contact	1500 ppm: CCROV*/SA*	Ing	resp sys, head, drow,	Skin	Water flush prompt	CNS
Wash skin:	When contam	1700 ppm: SA:CF*/PAPROV*/CCRFOV/	Con	narco	Breath:	Resp support	
Remove:	When wet (flam)	GMFOV/SCBAF/SAF			Swallow	Medical attention immed	
Change:	N.R.	§ SCBAF PD PP/SAF PD PP ASCBA					
		Escape GMFOV/SCBAE					
(n-Butyl acetate)							

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl P, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
sec-Butyl acetate <chem>CH3COOCH(CH3)CH2CH3</chem> 105-45-4 AF 7380000	sec-Butyl ester of acetic acid. 1-Methylpropyl acetate	NIOSH/OSHA 200 ppm (950 mg/m ³)	1700 ppm [LEL]	Colorless liquid with a pleasant, fruity odor.	MW 116.2 BP 234°F Sol 0.8% Fl P 62°F IP 9.91 eV	VP 10 mm FRZ -100°F UEL 9.8% LEL 1.7%	Nitrates, strong oxidizers, alkalis & acids	Char, CS, GC/FID, II [#1450 Esters I]
1123 26	1 ppm = 4.83 mg/m ³				Sp Gr 0.86 Class IB Flammable Liquid			
tert-Butyl acetate <chem>CH3COOC(CH3)3</chem> 540-88-5 AF 7400000	tert-Butyl ester of acetic acid	NIOSH/OSHA 200 ppm (950 mg/m ³)	1500 ppm [LEL]	Colorless liquid with a fruity odor	MW 116.2 BP 208°F Sol insoluble Fl P 72°F IP ?	VP ? FRZ ? UEL ? LEL 1.9%	Nitrates, strong oxidizers, alkalis & acids	Char, CS, GC/FID, II [#1450 Esters I]
1123 26	1 ppm = 4.83 mg/m ³				Sp Gr 0.87 Class IB Flammable Liquid			
Butyl acrylate <chem>CH2=CHCOOC4H9</chem> 141-32-2 UD 3150000	n-Butyl acrylate, Butyl ester of acrylic acid, Butyl 2-propenoate	NIOSH 10 ppm (55 mg/m ³) OSHA† none	N.D.	Clear, colorless liquid with a strong, fruity odor. [Note: Highly reactive; may con- tain an inhibitor to prevent spontaneous polymerization.]	MW: 126.2 BP: 293°F Sol: 0.1% Fl P: 103°F IP: ?	VP: 4 mm FRZ: -83°F UEL: 9.8% LEL: 1.5%	Strong acids & alkalis, amines, halogens, hydrogen compounds, oxidizers, heat, flame, sunlight [Note: Polymerizes readily on heating.]	None available
2348 26	1 ppm = 5.33 mg/m ³				Sp Gr: 0.89 Class II Combustible Liquid			
n-Butyl alcohol <chem>CH3CH2CH2CH2OH</chem> 71-36-3 EO 1400000	1-Butanol, n-Butanol, Butyl alcohol, 1-Hydroxybutane, n-Propyl carbinol	NIOSH C 50 ppm (150 mg/m ³) [skin] OSHA† 100 ppm (300 mg/m ³)	1400 ppm [LEL]	Colorless liquid with a strong, characteristic, mildly alcoholic odor	MW 74.1 BP 243°F Sol 9% Fl P 84°F IP 10.04 eV	VP 6 mm FRZ -129°F UEL 11.2% LEL 1.4%	Strong oxidizers, strong mineral acids, alkali metals, halogens	Char, 2-Propanol/ CS, GC/FID, II [#1401 Alcohols II]
1120 26	1 ppm = 3.08 mg/m ³				Sp Gr 0.81 Class IC Flammable Liquid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)	
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet (flammi) N.R.	NIOSH/OSHA 1700 ppm: SA:CF/PAPROV/ICCRFOV/ GMFOV/SCBAF/SAF § SCBAF PD PP/SAF PD,PP ASCBA Escape GMFOV/SCBAE	Inh Ing Con	Irrit eyes, head, drow, dryness upper resp sys, skin, narco	Eye Skin Breath Swallow	Irr immed Water flush prompt Resp support Medical attention immed	Eyes, skin, resp sys, CNS
[sec-Butyl acetate]							
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet (flamim) N.R.	NIOSH/OSHA 1500 ppm: SA:CF/PAPROV/ICCRFOV/ GMFOV/SCBAF/SAF § SCBAF PD PP/SAF PD,PP ASCBA Escape GMFOV/SCBAE	Inh Ing Con	Itch, inflam eyes, irrit upper resp tract, head, narco, derm	Eye Skin Breath Swallow	Irr immed Water flush prompt Resp support Medical attention immed	Resp sys, eyes, skin, CNS
[tert-Butyl acetate]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R. Eyewash, Quick drench	TBAL	Inh Abs Ing Con	Irrit eyes, skin, upper resp sys; sens derm; dysp	Eye: Skin: Breath: Swallow:	Irr immed Soap wash immed Resp support Medical attention immed	Eyes, skin, resp sys
[Butyl acrylate]							
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet (flamim) N.R.	NIOSH 1250 ppm: SA:CF/PAPROV 1400 ppm: CCRFOV/GMFOV/PAPRTOV/ SCBAF/SAF § SCBAF PD PP/SAF PD,PP ASCBA Escape GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, nose, throat, head, vert; drow, corinflamm blurred vision lac, photo, derm; possible auditory nerve damage, hearing loss; CNS depress	Eye Skin Breath Swallow	Irr immed Water flush prompt Resp support Medical attention immed	Eyes, skin, resp sys, CNS

[n-butyl alcohol]

Chemical name, structure/formula, CAS and RTECS No., and DOT ID and guide No.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
sec-Butyl alcohol $\text{CH}_3\text{CH}(\text{OH})\text{CH}_2\text{CH}_3$ 78-92-2 EO1750000	2-Butanol, Butylene hydrate, 2-Hydroxybutane, Methyl ethyl carbinol	NIOSH 100 ppm (305 mg/m ³) ST 150 ppm (455 mg/m ³) OSHA† 150 ppm (450 mg/m ³)	2000 ppm	Colorless liquid with a strong pleasant odor.	MW 74.1 BP 211°F Sol 16% Fl.P. 75°F IP. 10.10 eV	VP 12 mm FRZ -175°F UEL(212°F) 9.8% LEL(212°F) 1.7%	Strong oxidizers, organic peroxides, perchloric & permone- sulfuric acids	Char. 2-Propanol/ CS, GC/FID, II [#1401, Alcohols I]
1120 26	1 ppm = 3.08 mg/m ³				Sp Gr 0.81 Class IC Flammable Liquid			
tert-Butyl alcohol $(\text{CH}_3)_3\text{COH}$ 75-65-0 EO1925000	2-Methyl-2-propanol, Trimethyl carbinol	NIOSH 100 ppm (300 mg/m ³) ST 150 ppm (450 mg/m ³) OSHA† 100 ppm (300 mg/m ³)	1600 ppm	Colorless solid or liquid (above 78°F) with a camphor-like odor. [Note: Often used in aqueous solutions.]	MW 74.1 BP 180°F Sol Miscible Fl.P. 52°F IP. 9.70 eV	VP(77°F): 42 mm FRZ 78°F UEL 8.0% LEL 2.4%	Strong mineral acids, strong hydrochloric acid, oxidizers	Char., 2-Butanol/ CS, GC/FID, II [#1400, Alcohols I]
1120 26	1 ppm = 3.08 mg/m ³				Sp Gr 0.79 (Solid) Combustible Solid Class IB Flammable Liquid			
n-Butylamine $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{NH}_2$ 109-73-9 EO2975000	1-Aminobutane, Butylamine	NIOSH/OSHA C 5 ppm (15 mg/m ³) [skin]	300 ppm	Colorless liquid with a fishy, ammonia-like odor.	MW 73.2 BP 172°F Sol Miscible Fl.P. 10°F IP. 8.71 eV	VP 82 mm FRZ -58°F UEL 9.8% LEL 1.7%	Strong oxidizers, strong acids [Note: May corrode some metals in presence of water.]	Sr gel*, Methanol, GC/FID, II [#S138]
1125 68	1 ppm = 3.04 mg/m ³				Sp Gr 0.74 Class IB Flammable Liquid			
tert-Butyl chromate $[(\text{CH}_3)_3\text{CO}]_2\text{CrO}_2$ 1189-85-1 GB2900000	di-tert-Butyl ester of chromic acid	NIOSH Ca 0.001 mg Cr(VI)/m ³ See Appendix A See Appendix C OSHA 0.1 mg CrO ₂ /m ³ [skin] See Appendix C	Ca (15 mg/m ³) as Cr(VI)]	Liquid [Note: Solidifies at 32-23°F.]	MW 230.3 BP ? Sol ? Fl.P. ? IP. ?	VP ? FRZ 32-23°F UEL ? LEL ?	Reducing agents, moisture, acids, alcohols, hydrazine, combustible materials	Fiber, NaOH/Na ₂ CO ₃ , IC; II [#7664, Neurotoxic Chromate]
	1 ppm = 9.57 mg/m ³				Sp Gr ?			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)		First aid (See Table 6)	Target organs (See Table 5)
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, skin, nose,	Eye	Immerse	Eyes, skin, resp sys.
Eyes:	Prevent eye contact	1000 ppm: CCROV*/SA*	Inh	throat; narco	Skin	Water flush prompt	CNS
Wash skin:	When contam	2000 ppm: SA, CF/PAPROV*/CCRFQV/	Inh		Breath	Resp support	
Remove:	When wet (flam)	GMFOV/SCBAF/SAF	Con		Swallow	Medical attention	
Change:	N.R.	§ SCBAF PD PP/SAF PD PP ASCBA				immed	
		Escape: GMFOV/SCBAE					
[sec-Butyl alcohol]							
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin, nose,	Eye	Immerse	Eyes, skin, resp sys.
Eyes:	Prevent eye contact	1600 ppm: SA, CF/PAPROV*/CCRFQV/	Inh	throat; drow, narco	Skin	Water flush prompt	CNS
Wash skin:	When contam	GMFOV/SCBAF/SAF	Con		Breath	Resp support	
Remove:	When wet (flam)	§ SCBAF PD PP/SAF PD PP ASCBA			Swallow	Medical attention	
Change:	N.R.	Escape: GMFOV/SCBAE				immed	
[tert-Butyl alcohol]							
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin, nose,	Eye	Immerse	Eyes, skin, resp sys.
Eyes:	Prevent eye contact	50 ppm: CCRS*/SA*	Abs	throat; head; skin flush,	Skin	Water flush immed	
Wash skin:	When contam	125 ppm: SA, CF*/PAPRS*	Inh	burns	Breath	Resp support	
Remove:	When wet (flam)	250 ppm: CCRFS/GMFS/PAPRTS*/	Con		Swallow	Medical attention	
Change:	N.R.	SCBAF/SAF				immed	
Provide:	Eyewash, Quick drench	300 ppm: SAF PD, PP					
		§ SCBAF PD PP/SAF PD PP ASCBA					
		Escape: GMFS/SCBAE					
[Butylamine]							
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, skin, resp	Eye	Immerse	Eyes, skin, resp sys.
Eyes:	Prevent eye contact	§ SCBAF PD PP/SAF PD PP ASCBA	Abs	sys; eye, skin burns;	Skin	Soap wash immed	CNS
Wash skin:	When contam/Daily	Escape: GMFOVH/SCBAE	Inh	drow, mucous; skin	Breath	Resp support	[lung cancer]
Remove:	When wet or contam		Con	ulcers; lung changes;	Swallow	Medical attention	
Change:	N.R.			[carc]		immed	
Provide:	Eyewash, Quick drench						
[tert-Butyl chromate]							

Chemical name, structure formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
n-Butyl glycidyl ether $C_7H_{12}O_2$ 2426-08-6 TX4200000	BGE 1,2-Epoxy-3-butoxypropane	NIOSH C 5.6 ppm (30 mg/m ³) [15-min] OSHA† 50 ppm (270 mg/m ³)	250 ppm	Colorless liquid with an irritating odor.	MW: 130.2 BP: 327°F Sol: 2% FLP: 130°F IP: ?	VP: (77°F) 3 mm FRZ: ? UEL: ? LEL: ?	Strong oxidizers, strong caustics	Char; CS; GC/FID; IR [#581]
	1 ppm = 5.41 mg/m ³				Sp Gr: 0.91 Class II Combustible Liquid			
n-Butyl lactate $CH_3CH_2(OH)COOC_4H_9$ 138-22-7 OD4025000	Butyl ester of 2-hydroxy- propanoic acid, Butyl ester of lactic acid, Butyl lactate	NIOSH 5 ppm (25 mg/m ³) OSHA† none	N.D.	Clear, colorless to white liquid with a mild, transient odor.	MW: 146.2 BP: 370°F Sol: Slight FLP: 160°F IP: ?	VP: 0.4 mm FRZ: -45°F UEL: ? LEL: 1.15%	Strong acids & bases, strong oxidizers, heat, sparks, open flames	None available
1993 27 (combustible liquid, n.o.s.)	1 ppm = 6.08 mg/m ³				Sp Gr: 0.98 Class IIIA Combustible Liquid			
n-Butyl mercaptan $CH_3CH_2CH_2CH_2SH$ 109-79-5 EK6300000	Butanethiol, 1-Butanethiol, n-Butanethiol, 1-Mercaptobutane	NIOSH C 0.5 ppm (1.8 mg/m ³) [15-min] OSHA† 10 ppm (38 mg/m ³)	500 ppm	Colorless liquid with a strong garlic-, cabbage-, or skunk-like odor.	MW: 90.2 BP: 209°F Sol: 0.06% FLP: 35°F IP: 9.15 eV	VP: 35 mm FRZ: -176°F UEL: ? LEL: ?	Strong oxidizers (such as dry bleaches), acids	Filter*; HCl/DCE; FPD; IR [#2542]
2347 27	1 ppm = 3.75 mg/m ³				Sp Gr: 0.83 Class IB Flammable Liquid			
o-sec-Butylphenol $CH_3CH_2CH_2CH_2C_6H_4OH$ 89-72-5 SJ8920000	2-sec-Butylphenol, 2-(1-Methylpropyl)phenol	NIOSH 5 ppm (30 mg/m ³) [skin] OSHA† none	N.D.	Colorless liquid or solid (below 61°F).	MW: 150.2 BP: 227°F Sol: Insoluble FLP: 225°F IP: ?	VP: Low FRZ: 61°F UEL: ? LEL: ?	None reported	None available
2226 55 (liquid) 2229 53 (solid)	1 ppm = 6.24 mg/m ³				Sp Gr: 0.89 Class IB Combustible Liquid Combustible Solid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)		Target organs (See Table 5)
Skin:	Prevent skin contact	NIOSH					
Eyes:	Prevent eye contact	56 ppm CCROV/SA*	Inh	Irrit eyes, skin, nose,	Eye	Irmmmed	Eyes, skin, resp
Wash skin:	When contam	140 ppm SA CF/PAPROV*	Ing	sens. narco possible	Skin	Soap wash immed	sys, CNS, blood
Remove:	When wet or contam	250 ppm: CCRFOV/GMFOV/PAPRTOV/	Con	hemato effects; CNS	Breath:	Resp support	
Change:	N.R.	SCBAF/SAF		depress	Swallow:	Medical attention immed	
		§ SCBAF PD,PP/SAF PD,PP ASCBA					
		Escape GMFOV/SCBAE					
[n-Butyl glycidyl ether]							
Skin:	Prevent skin contact	TBAL	Inh	Irrit eyes, skin, nose,	Eye:	Irmmmed	Eyes, skin, resp sys,
Eyes:	Prevent eye contact		Ing	throat; drow, head, CNS	Skin:	Soap wash immed	CNS
Wash skin:	When contam		Con	depress; nau, vomit	Breath:	Resp support	
Remove:	When wet or contam				Swallow:	Medical attention immed	
Change:	N.R.						
Provide:	Eyewash, Quick drench						
[n-Butyl lactate]							
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, skin; muc	Eye	Irmmmed	Eyes, skin, resp sys.
Eyes:	Prevent eye contact	5 ppm CCROV/SA	Ing	weak, mal, sweat, nau,	Skin	Soap wash prompt	CNS, liver, kidneys
Wash skin:	When contam	12.5 ppm SA,CF/PAPROV	Con	vomit, head, conf;	Breath:	Resp support	
Remove:	When wet (flam)	25 ppm CCRFOV/GMFOV/PAPRTOV/		in animals: narco, mco,	Swallow:	Medical attention immed	
Change:	N.R.	SCBAF/SAF		weak, cyan, pulm irrit,			
		500 ppm SA PD,PP*		liver, kidney damage			
		§ SCBAF PD,PP/SAF PD,PP ASCBA					
		Escape GMFOV/SCBAE					
[n-Butyl mercaptan]							
Skin:	Prevent skin contact	TBAL	Inh	Irrit eyes, skin, resp sys;	Eye:	Irmmmed	Eyes, skin, resp sys
Eyes:	Prevent eye contact		Abs	skin burns	Skin:	Soap flush immed	
Wash skin:	When contam		Ing		Breath:	Resp support	
Remove:	When wet or contam		Con		Swallow:	Medical attention immed	
Change:	N.R.						
Provide:	Eyewash, Quick drench						
[o-sec-Butylphenol]							

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide No.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL, FL.P, IP, Sp, Gr, Flammability	VP, FRZ, UEL, LEL		
p-tert-Butyltoluene (CH ₃) ₂ CC ₆ H ₄ CH ₃ 98-51-1 X8400000	4-tert-Butyltoluene 1-Methyl-4-tert-butylbenzene	NIOSH 10 ppm (60 mg/m ³) ST 20 ppm (120 mg/m ³) OSHA† 10 ppm (60 mg/m ³)	100 ppm	Colorless liquid with a distinct aromatic odor, somewhat like gasoline	MW 148.3 BP 379°F Sol Insoluble FLP 155°F IP 8.28 eV	VP(77°F) 0.7 mm FRZ -62°F UEL 7 LEL 7	Oxidizers	Char. CS, GCFID, III [#1501 Aromatic Hydro- carbons]
2667 27	1 ppm = 6.16 mg/m ³				Sp Gr 0.86 Class IIIA Combustible Liquid			
n-Butyronitrile CH ₃ CH ₂ CH ₂ CN 109-74-0 E78750000	Butanenitrile, Butyronitrile, 1-Cyanopropane, Propyl cyanide, n-Propyl cyanide	NIOSH 8 ppm (22 mg/m ³) OSHA none	N.D.	Colorless liquid with a sharp, suffocating odor. [Note: Forms cyanide in the body.]	MW: 69.1 BP: 244°F Sol(77°F): 3% FLP: 62°F IP: 11.67 eV	VP: 14 mm FRZ: -170°F UEL: 7 LEL: 1.65%	Strong oxidizers & reducing agents, strong acids & bases	Char; Benzene; GCFID; II [Adapt #1608]
2411 28	1 ppm = 2.87 mg/m ³				Sp Gr: 0.81 Class IB Flammable Liquid			
Cadmium dust (as Cd) Cd (Metal) 7440-43-9 (Metal) EU9800000 (Metal)	Cadmium metal. Cadmium. Other synonyms vary depending upon the specific cadmium compound.	NIOSH* Ca See Appendix A OSHA* [1910.1027] 0.005 mg/m ³ [*Note: The REL and PEL apply to all Cadmium compounds (as Cd).]	Ca [9 mg/m ³ (as Cd)]	Metal. Silver-white, blue-tinged, lustrous, odorless solid.	MW 112.4 BP 1409°F Sol Insoluble FLP NA IP NA	VP 0 mm (approx) MLT 610°F UEL NA LEL NA	Strong oxidizers, elemental sulfur, selenium & tellurium	Filter, Acid, AAS, III [#7048]
2570 53 (compound)					Sp Gr 8.65 (Metal) Metal. Noncombustible Solid in bulk form, but will burn in powder form.			
Cadmium fume (as Cd) CdO/Cd 1305-19-0 (CdO) EV1930000 (CdO)	CdO Cadmium monoxide, Cadmium oxide fume Cd Cadmium	NIOSH* Ca See Appendix A OSHA* [1910.1027] 0.005 mg/m ³ [*Note: The REL and PEL apply to all Cadmium compounds (as Cd).]	Ca [9 mg/m ³ (as Cd)]	Odorless, yellow-brown, finely divided, particulate dispersed in air	MW 128.4 BP Decomposes Sol Insoluble FLP NA IP NA	VP 0 mm (approx) MLT 2599°F UEL NA LEL NA	Not applicable	Filter, Acid, AAS, III [#7048]
					Sp Gr 8.15 (crystalline form)/6.95 (amorphous form) Noncombustible Solid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 5)	Target organs (See Table 5)
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R.	NIOSH/OSHA 100 ppm: SA:CF/PAPROV/CCRFOV/ GMFOV/SCBAF/SAF § SCBAF PD, PP/SAF PD, PP ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Itch eyes, skin, dry nose, throat, head, low BP, tactar, abnor CVS stress; CNS, hemato depress, metallic taste; liver, kidney inj	Eye: Skin: Breath: Swallow:	Eyes, skin, resp sys. CVS, CNS, bone marrow, liver, kidneys
[p-tert-Butyltoluene]						
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet (flamem) N.R. Quick drench	NIOSH 80 ppm: CCRFOV/SA 200 ppm: SA:CF/PAPROV 400 ppm: CCRFOV/GMFOV/PAPRTOV/ SCBAF/SAF 1000 ppm: SAF PD, PP § SCBAF PD, PP/SAF PD, PP ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Itch eyes, skin, resp sys; head, dizz, weak, gidd, conf, convuls; dysp; abdom pain, nau, vomit	Eye: Skin: Breath: Swallow:	Eyes, skin, resp sys. CNS, CVS
[n-Butylacrylate]						
Skin: Eyes: Wash skin: Remove: Change:	N.R. N.R. Daily N.R. Daily	NIOSH ¼ SCBAF PD, PP/SAF PD, PP ASCBA Escape: HIEF/SCBAE	Inh Ing	Pulm edema; dysp, cough, chest tight, subs pain, head, chills, musc aches, nau, vomit, diarr, anos, emphy, prot, mild anemia, [canc]	Eye: Skin: Breath: Swallow:	Resp sys, kidneys, prostate, blood [prostatic & lung cancer]
[Cadmium dust (as Cd)]						
Skin: Eyes: Wash skin: Remove: Change:	N.R. N.R. Daily N.R. Daily	NIOSH ¼ SCBAF PD, PP/SAF PD, PP ASCBA Escape: HIEF/SCBAE	Inh	Pulm edema; dysp, cough, tight chest, subs pain, head, chills, musc aches, nau, vomit, diarr, emphy, prot, anos, mild anemia, [canc]	Breath: Resp support	Resp sys, kidneys, blood [prostatic & lung cancer]
[Cadmium fume (as Cd)]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL F.P., IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Calcium arsenate (as As) $\text{Ca}_3(\text{AsO}_4)_2$ 7778-44-1 CG0830000 1573 53	Calcium salt (2/3) of arsenic acid. Cucumber dust. Tricalcium arsenate. [Note: Also see specific listing for Arsenic (inorganic compounds, as As).]	NIOSH Ca C 0.002 mg/m ³ [15-min] See Appendix A OSHA [1910.1018] 0.010 mg/m ³	Ca [5 mg/m ³ (as As)]	Colorless to white, odorless solid [insecticide/ herbicide]	MW: 398.1 BP: Decomposes Sol: (77°F) 0.01% F.P.: NA IP: NA Sp Gr: 3.62 Noncombustible Solid	VP: 0 mm (approx) MLT: ? UEL: NA LEL: NA	None reported [Note: Produces toxic fumes of arsenic when heated to decomposition]	Filter; Acid; AAS; II [#7900, Arsenic]
Calcium carbonate CaCO_3 1317-65-3 EV9580000	Calcium salt of carbonic acid [Note: Occurs in nature as limestone, chalk, marble, dolomite, aragonite, calcite & oyster shells.]	NIOSH 10 mg/m ³ (total) 5 mg/m ³ (resp) OSHA 15 mg/m ³ (total) 5 mg/m ³ (resp)	N.D.	White, odorless powder or colorless crystals.	MW: 100.1 BP: Decomposes Sol: 0.001% F.P.: NA IP: NA Sp.Gr: 2.7-2.95 Noncombustible Solid	VP: 0 mm (approx) MLT: 2444°F 2442°F (Decomposes) UEL: NA LEL: NA	Acids, alum, ammonium salts, mercury & hydrogen, fluorine, magnesium	Filter; Acid; AAS; II [#7020, Calcium]
Calcium cyanamide CaCN_2 156-82-7 GS6000000 1403 40 (with >0.1% calcium carbide)	Calcium carbimide, Cyanamide, Lime nitrogen, Nitrogen lime [Note: Cyanamide is also a synonym for hydrogen cyanamide, NH_2CN .]	NIOSH 0.5 mg/m ³ OSHA† none	N.D.	Colorless, gray, or black crystals or powder. [fertilizer] [Note: Commercial grades may contain calcium carbide.]	MW: 80.1 BP: Sublimes Sol: insoluble F.P.: NA IP: NA Sp. Gr: 2.29 Noncombustible Solid, but a fire risk if it contains calcium carbide.	VP: 0 mm (approx) MLT: 2444°F UEL: NA LEL: NA	Water [Note: May polymerize in water or alkaline solutions to dicyanamide. Decomposes in water to form acetylene & ammonia.]	Filter; none; Grav; II [#0500, Nuisance Dust (total)]
Calcium hydroxide $\text{Ca}(\text{OH})_2$ 1305-62-6 EW2600000	Calcium hydrate, Caustic lime, Hydrated lime, Slaked lime	NIOSH 5 mg/m ³ OSHA 15 mg/m ³ (total) 5 mg/m ³ (resp)	N.D.	White, odorless powder. [Note: Readily absorbs CO_2 from the air to form calcium carbonate.]	MW: 74.1 BP: Decomposes Sol: (32°F): 0.2% F.P.: NA IP: NA Sp. Gr: 2.24 Noncombustible Solid	VP: 0 mm (approx) MLT: 1076°F (Decomposes) (Loses H_2O) UEL: NA LEL: NA	Maleic anhydride, phosphorus, nitroethane, nitromethane, nitropropane [Note: Attacks some metals.]	Filter; Acid; AAS; II [#7020, Calcium]

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)		Target organs (See Table 5)
Skin:	Prevent skin contact	NIOSH # SCBAF PD, PP/SAF PD, PP-ASCB Escape: Hi-E/SCBAE	Inh	Weak, GI dist, per neur,	Eye:	Irri	Eyes, resp sys,
Eyes:	Prevent eye contact		Abs	skin hyperpig, palmar	Skin:	Soap wash prompt	liver, skin, CNS,
Wash skin:	When contam/Daily		Ing	planter hyperkeratosis;	Breath:	Resp support	lymphatic sys
Remove:	When wet or contam		Con	derm. [canc]	Swallow:	Medical attention	[lymphatic &
Change:	Daily			in animals liver damage		Irri	lung cancer]
Provide:	Eyewash, Quick drench						
[Calcium arsenate (as As)]							
Skin:	N.R.	TBAL	Inh	Irri eyes, skin, resp	Eye:	Irri	Eyes, skin, resp sys
Eyes:	N.R.		Con	sys; cough	Skin:	Soap wash	
Wash skin:	N.R.				Breath:	Fresh air	
Remove:	N.R.						
Change:	N.R.						
[Calcium carbonate]							
Skin:	Prevent skin contact	TBAL	Inh	Irri eyes, skin, resp	Eye:	Irri	Eyes, skin, resp sys;
Eyes:	Prevent eye contact		Ing	sys; head, vert, rapid	Skin:	Soap flush irri	vasomotor sys
Wash skin:	When contam		Con	breath, low BP, nau,	Breath:	Resp support	
Remove:	When wet or contam			vomit; skin burns, sens;	Swallow:	Medical attention	
Change:	Daily			cough; Antabuse-like		Irri	
Provide:	Eyewash, Quick drench		effects				
[Calcium cyanamide]							
Skin:	Prevent skin contact	TBAL	Inh	Irri eyes, skin, upper	Eye:	Irri	Eyes, skin, resp sys
Eyes:	Prevent eye contact		Ing	resp sys; eye, skin burns;	Skin:	Soap flush irri	
Wash skin:	When contam/Daily		Con	skin vesic; cough, bron,	Breath:	Resp support	
Remove:	When wet or contam			pneu	Swallow:	Medical attention	
Change:	Daily					Irri	
Provide:	Eyewash, Quick drench						
[Calcium hydroxide]							

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL F.P., IP, Sp. Gr., Flammability	VP, FRZ UEL, LEL		
Calcium oxide CaO 1305-78-8 EW3100000	Burnt lime, Burnt lime, Lime Pebble lime, Quick lime, Unslaked lime	NIOSH 2 mg/m ³ OSHA 5 mg/m ³	25 mg/m ³	White or gray, odorless lumps or granular powder	MW 56.1 BP 5162°F Sol: Reacts F.P. NA IP NA	VP 0 mm (approx) MLT 4662°F UEL NA LEL NA	Water (liberates heat), fluorine, ethanol [Note: Reacts with water to form calcium hydroxide.]	Filter; Acid; AAS; II [#7020, Calcium]
1910 60					Sp. Gr. 3.34 Noncombustible Solid, but will support combustion by liberation of oxygen			
Calcium silicate CaSiO ₃ 1344-95-2 VV9150000	Calcium hydrosilicate, Calcium metasilicate, Calcium monosilicate, Calcium salt of silicic acid, Wollastonite (mineral)	NIOSH 10 mg/m ³ (total) 5 mg/m ³ (resp) OSHA 15 mg/m ³ (total) 5 mg/m ³ (resp)	N.D.	White or cream- colored, free- flowing powder. [Note: The com- mercial product is prepared from diatomaceous earth & lime.]	MW: 116.2 BP: 7 Sol: 0.01% F.P. NA IP: NA	VP: 0 mm (approx) MLT: 2804°F UEL: NA LEL: NA	None reported [Note: After prolonged contact with water, solution reverts to soluble calcium salts & amorphous silica.]	Filter; Acid; AAS; II [#7020, Calcium]
Calcium sulfate CaSO ₄ 7778-18-9 WS6920000	Anhydrous calcium sulfate, Anhydrous gypsum, Anhydrous sulfate of lime, Calcium salt of sulfuric acid [Note: Gypsum is the dihydrate form & Plaster of Paris is the hemihydrate form.]	NIOSH 10 mg/m ³ (total) 5 mg/m ³ (resp) OSHA 15 mg/m ³ (total) 5 mg/m ³ (resp)	N.D.	Odorless, white powder or colorless, crystalline solid. [Note: May have blue, gray, or reddish tinge.]	MW: 136.1 BP: Decomposes Sol: 0.3% F.P. NA IP: NA	VP: 0 mm (approx) MLT: 2840°F (Decomposes) UEL: NA LEL: NA	Diazomethane, aluminum phosphorus, water [Note: Hygroscopic (i.e., absorbs moisture from the air). Reacts with water to form Gypsum & Plaster of Paris.]	Filter; none; Grav; II [Nuisance Dust: #0500 (total), #0500 (resp)]
Camphor (synthetic) C ₁₅ H ₁₄ O 76-22-2 EX1225000	2-Camphonone, Gum camphor Laurel camphor Synthetic camphor	NIOSH/OSHA 2 mg/m ³	200 mg/m ³	Colorless or white crystals with a penetrating, aromatic odor.	MW 152.3 BP 399°F Sol: Insoluble F.P. 150°F IP 8.76 eV	VP 0.2 mm MLT 345°F UEL 3.5% LEL 0.6%	Strong oxidizers (especially chromic anhydride & potassium permanganate)	Char. Methanol/ CS, GC/FID; II [#1301, Ketones II]
2717 32					Sp. Gr. 0.99 Combustible Solid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)		Target organs (See Table 6)
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, skin, upper	Eye	Immersed	Eyes, skin, resp sys
Eyes:	Prevent eye contact	10 mg/m ³ DM	Inh	resp tract, ulcer, perf	Skin:	Water flush immed	
Wash skin:	When contam/Daily	20 mg/m ³ DMXSQ/SA	Con	nasal septum,	Breath:	Resp support	
Remove:	When wet or contam	25 mg/m ³ SA, CF/PAPRIE/HIEF/		pneum, derm	Swallow	Medical attention immed	
Change:	Daily	SCBAF/SAF					
Provide:	Eyewash, Quick drench	§ SCBAF PD, PP/SAF PD, PP, ASCBA					
		Escape: HIEF/SCBAE					
[Calcium oxide]							
Skin:	N.R.	TBAL	Inh	Irrit eyes, skin, upper	Eye:	Immersed	Eyes, skin, resp sys
Eyes:	N.R.		Con	resp sys	Skin:	Soap wash	
Wash skin:	N.R.				Breath:	Fresh air	
Remove:	N.R.						
Change:	N.R.						
[Calcium silicate]							
Skin:	N.R.	TBAL	Inh	Irrit eyes, skin, upper	Eye:	Immersed	Eyes, skin, resp sys
Eyes:	N.R.		Con	resp sys; conj; rhinitis,	Skin:	Soap wash	
Wash skin:	N.R.			epile	Breath:	Fresh air	
Remove:	N.R.						
Change:	N.R.						
[Calcium sulfide]							
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin, muc	Eye	Immersed	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	50 mg/m ³ SA, CF/PAPROVDM ¹	Abs	memb; nau, vomit, diarr,	Skin:	Soap wash immed	CNS
Wash skin:	When contam	100 mg/m ³ CCRFOVHIE/GMFOVHIE/	Inh	head, dizz, excitement,	Breath:	Resp support	
Remove:	When wet or contam	PAPRTOVHIE/SCBAF/SAF	Con	epilep convuls	Swallow:	Medical attention immed	
Change:	Daily	200 mg/m ³ SAF PD, PP					
		§ SCBAF PD, PP/SAF PD, PP, ASCBA					
		Escape: GMFOVHIE/SCBAE					
[Camphor, synthetic]							

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Caprolactam $C_6H_{11}NO$ 165-60-2 CM3675000	Aminocaproic lactam, epsilon-Caprolactam, Hexahydro-2H-azepin-2-one, 2-Oxohexamethyleneimine	NIOSH Dust: 1 mg/m ³ ST 3 mg/m ³ Vapor: 0.22 ppm (1 mg/m ³) ST 0.66 ppm (3 mg/m ³)	N.D.	White, crystalline solid or flakes with an unpleasant odor. [Note: Significant vapor concentra- tions would be expected only at elevated temperatures.]	MW: 113.2 BP: 515°F Sol: 53% FLP: 282°F IP: ?	VP: 0.00000008 mm MLT: 156°F UEL: 8.0% LEL: 1.4%	Strong oxidizers, (acetic acid + dinitrogen trioxide)	None available
	1 ppm = 4.70 mg/m ³	OSHA† none			Sp. Gr: 1.01 Combustible Solid			
Captafol $C_{10}H_7Cl_2NO_5$ 2425-06-1 GS4900000	Captofol; Difolatan®; N-[(1,1,2,2-Tetrachloro- ethylthio)-4-cyclohexene- 1,2-dicarboximide]	NIOSH Ca 0.1 mg/m ³ [skin] See Appendix A	Ca [N.D.]	White, crystalline solid with a slight, characteristic pungent odor. [fungicide] [Note: Available commercially as a wetttable powder or in liquid form.]	MW: 349.1 BP: Decomposes Sol: 0.0001% FLP: NA IP: NA	VP: 0.000008 mm MLT: 321°F (Decomposes) UEL: NA LEL: NA	Acids, acid vapors, strong oxidizers	Filter; none; Grav; II [#0500, Nuisance Dust (total)]
Capten $C_8H_6Cl_2NO_5$ 133-06-2 GW5075000	Captane; N-Trichloromethylmercapto- 4-cyclohexene-1,2- dicarboximide	NIOSH Ca 5 mg/m ³ See Appendix A	Ca [N.D.]	Odorless, white, crystalline powder. [fungicide] [Note: Commercial product is a yellow powder with a pungent odor.]	MW: 300.8 BP: Decomposes Sol(77°F): 0.0003% FLP: ? IP: NA	VP: 0 mm (approx) MLT: 352°F (Decomposes) UEL: ? LEL: ?	Strong alkaline materials (e.g., hydrated lime) [Note: Corrosive to metals.]	Filter; none; Grav; II [#0500, Nuisance Dust (total)]
9188 31		OSHA† none			Sp. Gr: 1.74 Combustible Solid; may be dissolved in flammable liquids.			
Carbaryl $CH_3NHCOOC_6H_4$ 63-25-2 FC5950000	α-Naphthyl N-methyl- carbamate 1-Naphthyl N-Methyl- carbamate, Sevin®	NIOSH/OSHA 5 mg/m ³	100 mg/m ³	White or gray, odorless, solid [pesticide]	MW: 201.2 BP: Decomposes Sol: 0.01% FLP: NA IP: ?	VP(77°F): <0.00004 mm MLT: 293°F UEL: NA LEL: NA	Strong oxidizers, strongly alkaline pesticides	Filter; Reagent, Vis, II [#5006]
2757 55					Sp. Gr: 1.23 Noncombustible Solid, but may be dissolved in flammable liquids			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)	
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet or contam Daily	TBAL	Inh ing Con	Irrit eyes, skin, resp sys; epis; derm, skin sens; asthma; irrity, conf, dizz, head; abdom cramps, diarr, neu, vomit; liver, kidney inj	Eye: Skin: Breath: Swallow:	In/Immed Water wash Immed Resp support Medical attention Immed	Eyes, skin, resp sys, CNS, CVS, liver, kidneys
[Caprolactam]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam/Daily When wet or contam Daily Eyewash, Quick drench	NIOSH §: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs ing Con	Irrit eyes, skin, resp sys; derm, skin sens; con; bron, wheez; diarr, vomit; liver, kidney inj; high BP; In animals: terato effects; [canc]	Eye: Skin: Breath: Swallow:	In/Immed Soap wash Immed Resp support Medical attention Immed	Eyes, skin, resp sys, CNS, liver, kidneys, CVS [In animals: tumors at many sites]
[Captalol]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent skin contact When contam/Daily When wet or contam Daily Eyewash, Quick drench	NIOSH §: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs ing Con	Irrit eyes, skin, upper resp sys; blurred vision; derm, skin sens; dysp; diarr, vomit; [canc]	Eye: Skin: Breath: Swallow:	In/Immed Soap wash Immed Resp support Medical attention Immed	Eyes, skin, resp sys, GI tract, liver, kidneys [In animals: duodenal tumors]
[Capten]							
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet or contam Daily	NIOSH/OSHA 50 mg/m ³ SA* 100 mg/m ³ SA:CF/SCBAF/SAF § SCBAF PD,PP/SAF PD,PP ASCBA Escape GMFOVHE/SCBAE	Inh Abs ing Con	Miosis, blurred vision, tear, rhin, saliv, sweat, abdom cramps, nau, vomit, diarr, tremor, cyan, convuls, irt skin, possible repro effects	Eye Skin Breath Swallow	In/Immed Soap wash prompt Resp support Medical attention Immed	Resp sys, CNS, CVS, skin, blood chol, repro sys

[Carbaryl]

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Carbofuran $C_{10}H_8NO_2$ 1563-66-2 FB9450000	2,3-Dihydro-2,2-dimethyl-7- benzofuran-1-yl methyl- carbamate; Furacarb®; Furadan®	NIOSH 0.1 mg/m ³ OSHA† none	N.D.	Odorless, white or grayish, crystalline solid. [Insecticide] [Note: May be dissolved in a liquid carrier.]	MW: 221.3 BP: ? Sol(77°F): 0.07% FLP: NA IP: NA Sp.Gr: 1.18 Noncombustible Solid	VP(77°F): 0.000003 mm MLT: 304°F UEL: NA LEL: NA	Alkaline substances, acid, strong oxidizers (e.g., perchlorates, peroxides, chlorates, nitrates, permanganates)	Filter; none; Grav; III [#0500, Nuisance Dust (total)]
2757 55								
Carbon black C 1333-86-4 FF5800000	Acetylene black, Channel black, Furnace black, Lamp black, Thermal black	NIOSH/OSHA 3.5 mg/m ³ NIOSH C6 0.1 mg PAHs/m ³ [Carbon black in presence of polycyclic aromatic hydrocarbons (PAHs)] See Appendix A See Appendix C	1750 mg/m ³	Black, odorless solid.	MW: 12.0 BP: Sublimes Sol: Insoluble FLP: NA IP: NA Sp.Gr: 1.8-2.1 Combustible Solid that may contain flammable hydrocarbons.	VP: 0 mm (approx) MLT: Sublimes UEL: NA LEL: NA	Strong oxidizers such as chlorates, bromates & nitrates	Filter; none; Grav; III [#5000]
Carbon dioxide CO_2 124-38-9 FF6400000	Carbonic acid gas, Dry ice [Note: Normal constituent of air (about 300 ppm)]	NIOSH 5000 ppm (9000 mg/m ³) ST 30,000 ppm (54,000 mg/m ³) OSHA† 5000 ppm (9000 mg/m ³)	40,000 ppm	Colorless, odorless gas [Note: Shipped as a liquefied compressed gas. Solid form is utilized as dry ice]	MW: 44.0 BP: Sublimes Sol(77°F): 0.2% FLP: NA IP: 13.77 eV RGasD: 1.53 Nonflammable Gas	VP: 56.5 atm MLT: -109°F (Sublimes) UEL: NA LEL: NA	Dusts of various metals, such as magnesium, zirconium, titanium, aluminum, chromium & manga- nese are ignitable and explosive when suspended in carbon dioxide. Forms carbonic acid in water.	Bag; none; GC/TCD; III [#S249]
1013 21 1845 21 (dry ice) 2187 21 (liquid)	1 ppm = 1.83 mg/m ³							
Carbon disulfide CS_2 75-15-0 FF6650000	Carbon bisulfide	NIOSH 1 ppm (3 mg/m ³) ST 10 ppm (30 mg/m ³) [skin] OSHA† 20 ppm C 30 ppm 100 ppm (30-min max peak)	500 ppm	Colorless to faint-yellow liquid with a sweet, ether-like odor. [Note: Reagent grades are foul smelling]	MW: 76.1 BP: 116°F Sol: 0.3% FLP: -22°F IP: 10.08 eV Sp.Gr: 1.26 Class IB Flammable Liquid	VP: 297 mm FRZ: -169°F UEL: 50.0% LEL: 1.3%	Strong oxidizers, chemically-active metals such as sodium, potassium & zinc; acids; rust; halogens; amines [Note: Vapors may be ignited by contact with ordinary light bulb]	Charl Dry tube; Toluene; GC/FPD; III [#1600]
1131 28	1 ppm = 3.16 mg/m ³							

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	Prevent skin contact	TBAL	Inh	Miosis, blurred vision;	Eye:	CNS, PNS, blood chol
Eyes:	Prevent eye contact		Abs	sweat, saliv, abdom cramps,	Skin:	
Wash skin:	When contam		ing	diarr, head, nau, vomit,	Breath:	Irritated
Remove:	When wet or contam		Con	weak; muscle twitch, inco,	Swallow:	Soap flush immed
Change:	Daily			convuls		Fresh air
Provide:	Eyewash, Quick drench					Medical attention immed

[Carbofuran]

Skin:	N.R.	NIOSH/OSHA	Inh	Cough; irrit eyes;	Eye	Resp sys, eyes
Eyes:	Prevent eye contact	17.5 mg/m ³ DM	Con	in presence of polycyclic	Breath:	[lymphatic cancer
Wash skin:	Daily	35 mg/m ³ DMXSO/SA		aromatic hydrocarbons [carb]		(in presence of
Remove:	N.R.	87.5 mg/m ³ SA CF/PAPROM				PAHs)]
Change:	N.R.	175 mg/m ³ HIEF/PAPRTHIE/SCBAF/SAF		In presence of polycyclic aromatic hydrocarbons		
		1750 mg/m ³ SA PD PP		NIOSH		
		§ SCBAF PD PP/SAF PD,PP ASCBA		§ SCBAF PD PP/SAF PD,PP ASCBA		
		Escape HIEF/SCBAE		Escape HIEF/SCBAE		

[Carbon black]

Skin:	Frostbite	NIOSH/OSHA	Inh	Head, dizz, restless,	Eye:	Resp sys, CVS
Eyes:	Frostbite	40,000 ppm: SA/SCBAF	Con	paros, dysp, sweat, mal,	Skin:	
Wash skin:	N.R.	§ SCBAF PD PP/SAF PD,PP ASCBA	(liq/	Incr heart rate, card	Breath:	Frostbite
Remove:	N.R.	Escape SCBAE	sol)	output, BP; coma asphy;		Resp support
Change:	N.R.			convuls, frostbite (liq, dry ice)		
Provide:	Frostbite					

[Carbon dioxide]

Skin:	Prevent skin contact	NIOSH	Inh	Dizz, head poor sleep,	Eye	CNS, PNS, CVS,
Eyes:	Prevent eye contact	10 ppm CCROV/SA	Abs	fig, ner, anox low-wgl	Skin	eyes, kidneys,
Wash skin:	When contam	25 ppm SA CF/PAPROV	ing	psychosis, polyneur	Breath	liver, skin, repro
Remove:	When wet (flamm)	50 ppm CCRFQV/GMFQV/PAPRTQV/	Con	Parkinson-like syndrome,	Swallow	sys
Change:	N.R.	SCBAF/SAF		ocular changes coronary		
		500 ppm SA PD PP		heart disease, gastritis,		
		§ SCBAF PD PP/SAF PD,PP ASCBA		kidney, liver inj, eye,		
		Escape GMFQV/SCBAE		skin burns, derm, repro		
				effects		

[Carbon disulfide]

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TLV unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL, FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Carbon monoxide CO 630-08-0 FG3500000	Carbon oxide, Flue gas, Monoxide	NIOSH/OSHA* 35 ppm (40 mg/m ³) C 200 ppm (229 mg/m ³) OSHA† 50 ppm (55 mg/m ³)	1200 ppm	Colorless, odorless gas. [Note: Shipped as a nonliquefied or liquefied compressed gas.]	MW: 28.0 BP: -313°F Sol: 2% FLP: NA (Gas) IP: 14.01 eV	VP: >35 atm MLT: -337°F UEL: 74% LEL: 12.5%	Strong oxidizers, bromine trifluoride, chlorine trifluoride, lithium	Bag none, ECA, II [#S340]
Carbon tetrabromide CBr ₄ 558-13-4 FG4725000	Carbon bromide, Methane tetrabromide, Tetrabromomethane	NIOSH 0.1 ppm (1.4 mg/m ³) ST 0.3 ppm (4 mg/m ³) OSHA† none	N.D.	Colorless to yellow-brown crystals with a slight odor.	MW: 331.7 BP: 374°F Sol: 0.02% FLP: NA IP: 10.31 eV	VP(205°F): 40 mm MLT: 194°F UEL: NA LEL: NA	Strong oxidizers, hexacyclohexyldiacid, lithium	None available
2516 53	1 ppm = 13.78 mg/m ³				Sp.Gr: 3.42 Noncombustible Solid			
Carbon tetrachloride CCl ₄ 56-23-5 FG4900000	Carbon chloride, Carbon tet, Freon® 104, Halon® 104, Tetrachloromethane	NIOSH Ca ST 2 ppm (12.6 mg/m ³) (60-min) See Appendix A OSHA† 10 ppm C 25 ppm 200 ppm (5-min max peak in any 4 hrs)	Ca [200 ppm]	Colorless liquid with a character- istic ether-like odor	MW: 153.8 BP: 170°F Sol: 0.05% FLP: NA IP: 11.47 eV	VP: 91 mm FRZ: -9°F UEL: NA LEL: NA	Chemically-active metals such as sodium, potassium & magnesium; fluorine, aluminum. [Note: Forms highly toxic phosgene gas when exposed to flames or welding arcs.]	Char, CS, GCFID, III [#1003, Halogenated Hydro- carbons]
1846 55	1 ppm = 6.39 mg/m ³				Sp Gr: 1.59 Noncombustible Liquid			
Carbonyl fluoride COF ₂ 353-50-4 FG6125000	Carbon difluoride oxide, Carbon fluoride oxide, Carbon oxyfluoride, Carbonyl difluoride, Fluoroformyl fluoride, Fluorophosgene	NIOSH 2 ppm (5 mg/m ³) ST 5 ppm (15 mg/m ³) OSHA† none	N.D.	Colorless gas with a pungent and very irritating odor. [Note: Shipped as a liquefied compressed gas.]	MW: 66.0 BP: -118°F Sol: Reacts FLP: NA IP: 13.02 eV	VP: 55.4 atm FRZ: -173°F UEL: NA LEL: NA	Heat, moisture, hexafluoroisopropyl- ideneaziridine-lithium [Note: Reacts with water to form hydrogen fluoride & carbon dioxide.]	None available
2417 15	1 ppm = 2.74 mg/m ³				RGasD: 2.29 Nonflammable Gas:			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	Frostbite	NIOSH	Inh	Head, tachypnea, nau,	Eye:	CVS, lungs,
Eyes:	Frostbite	350 ppm SA	Con	weak, dizz, conf, halo,	Skin:	frostbite
Wash skin:	N.R.	875 ppm SA CF	(liq)	cyan, depress S-T segment of	Breath:	Resp support
Remove:	When wet (flam)	1200 ppm: GMFS/SCBAF/SAF		electrocardiogram, angina,		
Change:	N.R.	5 SCBAF PD PP/SAF PD PP ASCBA		syncope		
Provide:	Frostbite	Escape: GMFS/SCBAE				
[Carbon monoxide]						
Skin:	N.R.	TBAL	Inh	Irrit eyes, skin, resp	Eye:	Eyes, skin, resp sys,
Eyes:	Prevent eye contact		ing	sys; lac; lung, liver,	Skin:	liver, kidneys
Wash skin:	Daily		Con	kidney inj;	Breath:	
Remove:	N.R.			in animals: com damage	Swallow:	
Change:	Daily					
Provide:	Eyewash					
[Carbon tetrabromide]						
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, skin, CNS	Eye	CNS: eyes,
Eyes:	Prevent eye contact	& SCBAF PD PP/SAF PD PP ASCBA	Abs	depress, nau, vomit, liver,	Skin	lungs, liver
Wash skin:	When contam	Escape: GMFOV/SCBAE	ing	kidney inj; drows, dizz,	Breath	kidneys, skin
Remove:	When wet or contam		Con	inco; [canc]	Swallow	[in animals: liver cancer]
Change:	N.R.					
Provide:	Eyewash, Quick drench					
[Carbon tetrachloride]						
Skin:	Frostbite	TBAL	Inh	Irrit eyes, skin, muc	Eye:	Eyes, skin, resp sys,
Eyes:	Frostbite		Con	membr, resp sys; eye, skin	Skin:	bone
Wash skin:	N.R.			burns; lac; cough, pulm	Breath:	
Remove:	N.R.			edema, dysp; chronic		
Change:	N.R.			exposure: GI pain, muscle		
Provide:	Frostbite			fib, skeletal fluorosis; liq: frostbite		
[Carbonyl fluoride]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P., IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Catechol $C_6H_4(OH)_2$ 120-88-8 UX1088000	1,2-Benzenediol; resorcinol; 1,2-Dihydroxybenzene; o-Dihydroxybenzene; 2-Hydroxyphenol; Pyrocatechol	NIOSH 5 ppm (20 mg/m ³) [skin] OSHA† none	N.D.	Colorless, crystalline solid with a faint odor. [Note: Discolors to brown in air & light.]	MW: 110.1 BP: 47.4°F Sol: 44% FLP: 261°F IP: ?	VP(244°F): 10 mm MLT: 221°F UEL: 7 LEL: 1.4%	Strong oxidizers, nitric acid	None available
	1 ppm = 4.68 mg/m ³				Sp. Gr: 1.34 Combustible Solid			
Cellulose $(C_6H_{10}O_5)_n$ 9004-34-8 FJ5691460	Hydroxycellulose, Pyrocellulose	NIOSH 10 mg/m ³ (total) 5 mg/m ³ (resp) OSHA 10 mg/m ³ (total) 5 mg/m ³ (resp)	N.D.	Odorless, white substance. [Note: The principal fiber cell wall material of vegetable tissues (wood, cotton, flax, grass, etc.).]	MW: 160,000- 560,000 BP: Decomposes Sol: Insoluble FLP: NA IP: NA	VP: 0 mm (approx) MLT: 500-518°F (Decomposes) UEL: NA LEL: NA	Water, bromine, perfluorinated, sodium nitrate, fluorine, strong oxidizers	Filter; none; Grav; III [Reference Dust: #0500 (total), #0600 (resp)]
Cesium hydroxide CsOH 21351-79-1 FK9800000	Cesium hydrate, Cesium hydroxide dimer	NIOSH 2 mg/m ³ OSHA† none	N.D.	Colorless or yellowish, crystalline solid. [Note: Hygroscopic (i.e., absorbs moisture from the air.)]	MW: 149.9 BP: 7 Sol(50°F): 395% FLP: NA IP: NA	VP: 0 mm (approx) MLT: 522°F UEL: NA LEL: NA	Water, acids, CO, metals (e.g., Al, Pb, Sn, Zn), oxygen [Note: CsOH is a strong base, causing the generation of considerable heat in contact with water or moisture.]	None available
					Sp. Gr: 3.88 Noncombustible Solid			
Chlordane $C_{10}H_6Cl_8$ 57-74-9 PB9800000	Chlordane; Chlordane; 1,2,4,5,6,7,8,8- Octachloro-3a,4,7,7a- tetrahydro-4,7- methanonane	NIOSH Ca 0.5 mg/m ³ (skin) See Appendix A OSHA 0.5 mg/m ³ (skin)	Ca [100 mg/m ³]	Amber-colored, viscous liquid with a pungent, chlorine-like odor [insecticide]	MW: 409.8 BP: Decomposes Sol: 0.0001% FLP: NA IP: ?	VP: 0.00001 mm FRZ: 217-228°F UEL: NA LEL: NA	Strong oxidizers, alkaline reagents	Filter/ Chrom-102; Toluene, GC/ECD, III [#5510]
2752 28	1 ppm = 17.04 mg/m ³				Sp. Gr(77°F): 1.8 Noncombustible Liquid, but may be utilized in flammable solutions.			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)		Target organs (See Table 5)
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam Daily Eyewash	TBAL	Inh Abs Ing Con	Irrit eyes, skin, resp sys; skin sens, dermat; lac, burns eyes; convuls, incr BP, kidney inj	Eye: Skin: Breath: Swallow:	Irrigated Water wash Immed Resp support Medical attention immed	Eyes, skin, resp sys, CNS, kidneys
[Catechol]							
Skin: Eyes: Wash skin: Remove: Change:	N.R. N.R. N.R. N.R. N.R.	TBAL	Inh Con	Irrit eyes, skin, muc memb	Eye: Skin: Breath:	Irrigated Soap wash Fresh air	Eyes, skin, resp sys
[Cellulose]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam Daily Eyewash, Quick drench	TBAL	Inh Ing Con	Irrit eyes, skin, upper resp tract; eye, skin burns	Eye: Skin: Breath: Swallow:	Irrigated Water flush Immed Resp support Medical attention immed	Eyes, skin, resp sys
[Cesiumhydrosides]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam Daily Eyewash, Quick drench	NIOSH N SCBAF PD PP/SAF PD, PP ASCBA Escape GMFOVH/E/SCBAE	Inh Abs Ing Con	Blurred vision, conf ataxia, delirium, cough, abdom pain, nau, vomit, diarr, irrit, tremor, convuls, anura in animals lung, liver kidney damage, [canc]	Eye Skin Breath Swallow	Irrigated Soap wash Immed Resp support Medical attention immed	CNS, eyes, lungs, liver, kidneys [in animals liver cancer]
[Chlordane]							

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Chlorinated camphene $C_{10}H_{16}Cl_2$ 8001-35-2 XW5250000	Chlorocamphene, Octachlorocamphene, Polychlorocamphene, Toxaphene	NIOSH Ca [skin] See Appendix A OSHA† 0.5 mg/m ³ [skin]	Ca [200 mg/m ³]	Amber, waxy solid with a mild, piney, chlorine- and camphor-like odor. [insecticide]	MW 413.8 BP: Decomposes Sol: 0.0003% FLP: NA IP: ? Sp Gr: 1.65 Noncombustible Solid, but may be dissolved in flammable liquids.	VP(77°F) 0.4 mm MLT: 149-194°F UEL: NA LEL: NA	Strong oxidizers [Note: Slightly corrosive to metals under most conditions.]	Filter; Petroleum ether; GC/ECD; IR [#567]
2761 55								
Chlorinated diphenyl oxide $C_{12}H_{10}Cl_2O$	Synonyms depend on the degree of chlorination of diphenyl oxide [(C ₆ H ₄) ₂ O], ranging from monochlorodi- phenyl oxide [(C ₆ H ₄ Cl)(C ₆ H ₄)O] to dechlorodiphenyl oxide [(C ₆ Cl ₂)(C ₆ Cl ₂)O].	NIOSH/OSHA 0.5 mg/m ³	5 mg/m ³	Appearance and odor vary depending upon the specific compound.	Properties vary depending upon the specific compound.		Strong oxidizers	Filter; Isocutane; GC/EConD; IR [#5025, Chlori- nated diphenyl ether]
		1 ppm = 8.5-21.4 mg/m ³						
Chlorine Cl_2 7782-50-5 FO2100000	Molecular chlorine	NIOSH C 0.5 ppm (1.45 mg/m ³) [15-min] OSHA† C 1 ppm (3 mg/m ³)	10 ppm	Greenish-yellow gas with a pungent, irritating odor. [Note: Shipped as a liquefied compressed gas.]	MW 70.9 BP: -29°F Sol: 0.7% FLP: NA IP: 11.48 eV RGasD: 2.47 Nonflammable Gas, but a strong oxidizer.	VP: 6.8 atm FRZ: -150°F UEL: NA LEL: NA	Reacts explosively or forms explosive compounds with many common substances such as acetylene, ether, turpentine, ammonia, fuel gas, hydrogen & finely divided metals.	Filter; Na ₂ S ₂ O ₈ ; IC; IR [#6011]
1017 20								
		1 ppm = 2.95 mg/m ³						
Chlorine dioxide ClO_2 10049-04-4 FO3000000	Chlorine oxide, Chlorine peroxide	NIOSH 0.1 ppm (0.3 mg/m ³) ST 0.3 ppm (0.9 mg/m ³) OSHA† 0.1 ppm (0.3 mg/m ³)	5 ppm	Yellow to red gas or a red-brown liquid (below 52°F) with an unpleasant odor similar to chlorine and nitric acid	MW 67.5 BP: 52°F Sol(77°F): 0.3% FLP: NA (Gas) ? (Liq) IP: 10.36 eV RGasD: 2.33 Sp Gr: 1.6 (Liquid at 32°F) Flammable Gas/Combustible Liquid	VP: >1 atm FRZ: -74°F UEL: ? LEL: ?	Organic materials, heat, phosphorus, potassium hydroxide, sulfur, mercury, carbon monoxide [Note: Unstable in light. A powerful oxidizer.]	But; IC; IC; OSHA [RD202]
		1 ppm = 2.81 mg/m ³						

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection – maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	Prevent skin contact	NIOSH	Inh	Nau. conf. agitation,	Eye	CNS, skin
Eyes:	Prevent eye contact	✓ SCBAF PD PP/SAF PD PP ASCBA	Abs	tremor, convuls.	Skin	(in animals:
Wash skin:	When contam/Daily	Escape GMF DVH/E/SCBAE	Inh	uncon; dry/red	Breath	liver/cancer)
Remove:	When wet or contam		Ing	skin. (Garc)	Swallow	
Change:	Daily		Con			
Provide:	Eyewash, Quick drench					
[Chlorinated camphene]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Acne-form derm liver	Eye	Skin, liver
Eyes:	Prevent eye contact	5 mg/m ³ SA/SCBAF	Ing	damage	Skin	
Wash skin:	When contam	5 SCBAF PD PP/SAF PD PP ASCBA	Con		Breath	
Remove:	When wet or contam	Escape GMF DVAGH/E/SCBAE			Swallow	
Change:	Daily					
[Chlorinated diphenyl oxide]						
Skin:	Frostbite	NIOSH	Inh	Burning of eyes, nose,	Eye:	Eyes, skin, resp sys
Eyes:	Frostbite	5 ppm CCRS*/SA*	Con	mouth, fac, rhin cough,	Skin:	
Wash skin:	N.R.	10ppm: SA, CF*/PAPRS*/CCRFs/		choking, subs pain nau	Breath	
Remove:	N.R.	GMFS/SCBAF/SAF		vomit, head dizz, syncope,		
Change:	N.R.	5 SCBAF PD PP/SAF PD PP ASCBA		pulm edema, pneu hypox,		
Provide:	Frostbite	Escape GMFS/SCBAE		derm, liq: frostbite		
[Chlorine]						
Skin:	Prevent skin contact (liq)	NIOSH/OSHA	Inh	Irrit eyes, nose, throat,	Eye	Eyes, resp sys
Eyes:	Prevent eye contact (liq)	1 ppm: CCRS*/SA	Ing	cough, wheez, bron, pulm	Skin	
Wash skin:	When contam (liq)	2.5 ppm: SA, CF*/PAPRS*	(liq)	edema, chronic bron	Breath	
Remove:	When wet (flam)	5 ppm: CCRFS /GMFS /SCBAF/SAF	Con		Swallow	
Change:	N.R.	5 SCBAF PD PP/SAF PD PP ASCBA				
Provide:	Eyewash (liq), Quick drench (liq)	Escape GMFS /SCBAE				
[Chlorine dioxide]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL, FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Chlorine trifluoride CF ₃ 7790-91-2 F02800000	Chlorine fluoride, Chlorotrifluoride	NIOSH/OSHA C 0.1 ppm (0.4 mg/m ³)	20 ppm	Colorless gas or a greenish-yellow liquid (below 53°F) with a somewhat sweet, suffocating odor. [Note: Shipped as a liquefied compressed gas.]	MW 92.5 BP 53°F Sol. Reacts FLP NA IP 13.00 eV RGSD: 3.21 Sp Gr 1.77 (Liquid at 53°F) Nonflammable Gas Noncombustible Liquid, but contact with organic materials may result in SPONTANEOUS ignition.	VP 1.4 atm FRZ -105°F UEL NA LEL NA	Oxidizers, water, acids, combustible materials, sand, glass, metals (corrosive) [Note: Reacts with water to form chlorine & hydro- fluoric acid.]	None available
1749 44	1 ppm = 3.85 mg/m ³							
Chloroacetaldehyde ClCH ₂ CHO 107-20-0 A82450000	Chloroacetaldehyde (40% aqueous solution), 2-Chloroacetaldehyde, 2-Chloroethanal	NIOSH/OSHA C 1 ppm (3 mg/m ³)	45 ppm	Colorless liquid with an acid, penetrating odor. [Note: Typically found as a 40% aqueous solution.]	MW 78.5 BP 186°F Sol. Miscible FLP 190°F (40% soln.) IP 10.61 eV Sp Gr 1.19 (40% solution) Class IHA Combustible Liquid	VP 100 mm FRZ -3°F (40% soln.) UEL ? LEL ?	Oxidizers, acids	Sig el Met hand, GC/ECD, # [#S11]
2232 55	1 ppm = 3.26 mg/m ³							
α-Chloroacetophenone C ₆ H ₅ COCH ₂ Cl 532-27-4 A66300000	2-Chloroacetophenone, Chloromethyl phenyl ketone, Macrod, Phenacyl chloride, Phenyl chloromethyl ketone, Tear gas	NIOSH/OSHA 0.3 mg/m ³ (0.05 ppm)	15 mg/m ³	Colorless to gray crystalline solid with a sharp, irritating odor.	MW 154.6 BP 472°F Sol. Insoluble FLP 244°F IP 9.44 eV Sp Gr 1.32 Combustible Solid	VP 0.005 mm MLT 134°F UEL ? LEL ?	Water, steam, strong oxidizers [Note: Slowly corrodes metals.]	Tenax GC (2), Thermal desorp. GC/FID, IR/5, [P&CAM #291]
1697 58	1 ppm = 6.42 mg/m ³							
Chloroacetyl chloride ClCH ₂ COCl 79-04-9 A08475000	Chloroacetic acid chloride, Chloroacetyl chloride, Monochloroacetyl chloride	NIOSH 0.05 ppm (0.2 mg/m ³) OSHA† none	N.D.	Colorless to yellowish liquid with a strong, pungent odor.	MW: 112.9 BP: 223°F Sol: Decomposes FLP: NA IP: 10.30 eV Sp. Gr: 1.42 Noncombustible Liquid	VP: 19 mm FRZ: -7°F UEL: NA LEL: NA	Water, alcohols, bases, metals (corrosive), amines [Note: Decomposes in water to form chloroacetic acid & hydrogen chloride gas.]	None available
1762 59	1 ppm = 4.67 mg/m ³							

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Eyes, skin burns (liq or	- Eye	Skin, eyes, resp sys
Eyes:	Prevent eye contact	2.5 ppm: SA CF*	Inh	high vap conc; resp irrit;	Skin	
Wash skin:	When contam (liq)	5 ppm: SCBAF/SAF	Inh	in animals lac, corn	Breath	
Remove:	When wet or contam (liq)	20 ppm: SAF PD PP	Inh	ulcer, pulm edema	Swallow	
Change:	N.R.	§ SCBAF PD PP/SAF PD PP ASCBA	Con			
Provide:	Eyewash (liq), Quick drench (liq)	Escape: GMFS/SCBAE				
[Chlorine trifluoride]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit skin, eyes, muc	Eye	Eyes, skin, resp sys
Eyes:	Prevent eye contact	10 ppm: CCROV*/SA*	Abs	memb, skin burns, eye	Skin	
Wash skin:	When contam	25 ppm: SA CF*/PAPROV*	Inh	damage, pulm edema,	Breath	
Remove:	When wet or contam	45 ppm: CCRFOV/GMFOV/PAPROV*/	Con	skin, resp sys sens	Swallow	
Change:	N.R.	SCBAF/SAF				
Provide:	Eyewash, Quick drench	§ SCBAF PD PP/SAF PD PP ASCBA				
Escape: GMFOV/SCBAE						
[Chloroacetaldehyde]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin, resp sys,	Eye	Eyes, skin, resp sys
Eyes:	Prevent eye contact	3 mg/m ³ : CCROVDM/SA	Inh	pulm edema	Skin	
Wash skin:	When contam	7.5 mg/m ³ : SA CF*/PAPROVDM*	Inh		Breath	
Remove:	When wet or contam	15 mg/m ³ : CCRFOVHE/GMFSHIE/	Con		Swallow	
Change:	Daily	SCBAF/SAF				
Provide:	Eyewash	§ SCBAF PD PP/SAF PD PP ASCBA				
Escape: GMFSHIE/SCBAE						
[α-Chloroacetophenone]						
Skin:	Prevent skin contact	TBAL	Inh	Irrit eyes, skin, resp	Eye:	Eyes, skin, resp sys
Eyes:	Prevent eye contact		Abs	sys; eye, skin burns;	Skin:	
Wash skin:	When contam		Inh	cough, wheez, dysp; lac	Breath:	
Remove:	When wet or contam		Con		Swallow:	
Change:	N.R.					
Provide:	Eyewash, Quick drench					

Phosgene (phosgene)

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TLWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Chlorobenzene C_6H_5Cl 108-90-7 CZ0175000	Benzene chloride, Chlorobenzol, MCB, Monochlorobenzene, Phenyl chloride	NIOSH See Appendix D OSHA 75 ppm (350 mg/m ³)	1000 ppm	Colorless liquid with an almond- like odor.	MW 112.6 BP: 210°F Sol: 0.05% FLP: 82°F IP: 9.07 eV	VP: 9 mm FRZ: -50°F UEL: 9.6% LEL: 1.3%	Strong oxidizers	Char, CS, GCFID: II [#1003, Halo- genated Hydro- carbons]
1134 27	1 ppm = 4.68 mg/m ³				Sp Gr 1.11 Class IC Flammable Liquid			
o-Chlorobenzylidene malononitrile $ClC_6H_4CH=C(CN)_2$ 2698-41-1 OO3675000	2-Chlorobenzalmononitrile, CS, OCBM	NIOSH C 0.05 ppm (0.4 mg/m ³) [skin] OSHA† 0.05 ppm (0.4 mg/m ³)	2 mg/m ³	White crystalline solid with a pepper-like odor.	MW 188.6 BP: 590-599°F Sol: Insoluble FLP: ? IP: ?	VP: 0.00003 mm MLT: 203-205°F UEL: ? LEL: ? MEC: 25 g/m ³	Strong oxidizers	Fiter/ Tenax GC; Reagent, HPLC/UV, II(S) [PSCAM #304]
	1 ppm = 7.84 mg/m ³				Sp Gr ? Combustible Solid			
Chlorobromomethane CH_2BrCl 74-97-5 PA5250000	Bromochloromethane, CB, CBM, Fluorocarbon 1011, Halont® 1011, Methyl chlorobromide	NIOSH/OSHA 200 ppm (1050 mg/m ³) OSHA† 0.05 ppm (0.4 mg/m ³)	2000 ppm	Colorless to pale- yellow liquid with a chloroform-like odor [Note: May be used as a fire extinguishing agent.]	MW 129.4 BP: 155°F Sol: Insoluble FLP: NA IP: 10.77 eV	VP: 115 mm FRZ: -124°F UEL: NA LEL: NA	Chemically-active metals such as calcium, powdered aluminum, zinc & magnesium	Char, CS, GCFID: II [#1003, Halo- genated Hydro- carbons]
1887 58	1 ppm = 5.38 mg/m ³				Sp Gr 1.93 Noncombustible Liquid			
Chlorodifluoromethane $CHClF_2$ 75-45-6 PA6390000	Difluorochloromethane, Fluorocarbon-22, Freon® 22, Genetron® 22, Monochlorodifluoromethane, Refrigerant 22	NIOSH 1000 ppm (3500 mg/m ³) ST 1250 ppm (4375 mg/m ³) OSHA† none	N.D.	Colorless gas with a faint, sweetish odor. [Note: Shipped as a liquefied compressed gas.]	MW: 86.5 BP: -41°F Sol(77°F): 0.3% FLP: NA IP: 12.45 eV	VP: 9.4 atm FRZ: -231°F UEL: NA LEL: NA	Alkalis, alkaline earth metals (e.g., powdered aluminum, sodium, potassium, zinc)	None available
1018 12	1 ppm = 3.59 mg/m ³				RGasD: 3.11 Nonflammable Gas			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 6)	
Skin: Eyes: Wash skin: Change: Remove:	Prevent skin contact Prevent eye contact When contam N.R. When wet (flamm)	OSHA 1000 ppm: SA: CF/PAPROV/CCRFOV/ GMFOV/SCBAF/SAF § SCBAF PD PP/SAF PD PP ASCBA Escape GMFOV/SCBAE	Inh Ing Con	Irrit eyes, skin, nose, drow, nco, CNS depres; in animals liver, lung, kidney inj	Eye: Skin: Breath: Swallow	Irrimed Soap wash prompt Resp support Medical attention immed	Eyes, skin, resp sys, CNS, liver
[Chlorobenzene]							
Skin: Eyes: Wash skin: Change: Remove:	Prevent skin contact Prevent eye contact When contam/Daily Daily When wet or contam	NIOSH/OSHA 2 mg/m ³ : SA: CF/GMFSHIE/SCBAF/SAF § SCBAF PD PP/SAF PD PP ASCBA Escape GMFSHIE/SCBAE	Inh Abs Ing Con	Pain, burn eyes, lac, conj, eryt eyelids, blepharospasm, irit throat, cough, chest tight; head, eryt, vasc skin	Eye: Skin: Breath: Swallow	Irrimed Soap wash immed Resp support Medical attention immed	Eyes, skin, resp sys
[o-Chlorobenzylidene malononitrile]							
Skin: Eyes: Wash skin: Change: Remove:	Prevent skin contact Prevent eye contact When contam N.R. When wet or contam	NIOSH/OSHA 2000 ppm: SA: CF/PAPROV/CCRFOV/ GMFOV/SCBAF/SAF § SCBAF PD PP/SAF PD PP ASCBA Escape GMFOV/SCBAE	Inh Ing Con	Irrit eyes, skin, throat, conf, dizz, CNS depres; pum edema	Eye: Skin: Breath: Swallow	Irrimed Soap wash prompt Resp support Medical attention immed	Eyes, skin, resp sys, liver, kidneys, CNS
[Chlorobromomethane]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Frostbite Frostbite N.R. N.R. Frostbite	TBAL	Inh Con (liq)	Irrit resp sys; conf, drow, ringing in ears; heart palp, card arrhy; asphy; liver, kidney, spleen inj; liq: frostbite	Eye: Skin: Breath:	Frostbite Frostbite Resp support	Resp sys, CVS, CNS, liver, kidneys, spleen
[Chlorodifluoromethane]							

Chemical name, structural formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P. IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Chlorodiphenyl (42% chlorine) $C_6H_4ClC_6H_4Cl$ (approx) 53469-21-9 TQ1356000	Aroclor® 1242, PCB Polychlorinated biphenyl	NIOSH* Ca 0.001 mg/m³ See Appendix A [Note: The NIOSH REL also applies to other PCBs.] OSHA 1 mg/m³ [skin]	Ca [5 mg/m³]	Colorless to light- colored, viscous liquid with a mild, hydrocarbon odor	MW 256 (approx) BP 617-691°F Sol Insoluble Fl.P. NA IP ? Sp Gr (77°F) 1.39 Nonflammable liquid, but exposure in a fire results in the formation of a black soot containing PCBs, polychlorinated dibenzofurans & chlorinated dibenzo-p-dioxins	VP 0.001 mm FRZ -2°F UEL NA LEL NA	Strong oxidizers	Filter/ Florisil, Hexane, GC/ECD, III [#5503, PCBs]
2315 31	1 ppm 10.72 mg/m³ (approx)							
Chlorodiphenyl (54% chlorine) $C_6H_3Cl_2C_6H_2Cl_2$ (approx) 11097-69-1 TQ1360000	Aroclor® 1254, PCB Polychlorinated biphenyl	NIOSH* Ca See Appendix A 0.001 mg/m³ [Note: The NIOSH REL also applies to other PCBs.] OSHA 0.5 mg/m³ [skin]	Ca [5 mg/m³]	Colorless to pale- yellow, viscous liquid or solid (below 50°F) with a mild, hydro- carbon odor	MW 326 (approx) BP 689-734°F Sol Insoluble Fl.P. NA IP ? Sp Gr (77°F) 1.38 Nonflammable liquid, but exposure in a fire results in the formation of a black soot containing PCBs, polychlorinated dibenzofurans & chlorinated dibenzo-p-dioxins	VP 0.00006 mm FRZ 50°F UEL NA LEL NA	Strong oxidizers	Filter/ Florisil, Hexane, GC/ECD, III [#5503, PCBs]
2315 31	1 ppm 13.55 mg/m³ (approx)							
Chloroform $CHCl_3$ 67-66-3 FS9100000	Methane trichloride, Trichloromethane	NIOSH Ca See Appendix A ST 2 ppm (9.78 mg/m³) [60-min] OSHA* C 50 ppm (240 mg/m³)	Ca [500 ppm]	Colorless liquid with a pleasant odor	MW 119.4 BP 143°F Sol (77°F) 0.9% Fl.P. NA IP 11.42 eV Sp Gr 1.48 Noncombustible Liquid	VP 160 mm FRZ -82°F UEL NA LEL NA	Strong caustics, chemically-active metals such as aluminum or mag- nesium powder, sodium and potassium, strong oxidizers [Note: When heated to decomposition, forms phosgene gas]	Char, CS, GC/FID, III [#1003, Haloge- nated Hydro- carbons]
1888 55	1 ppm = 4.96 mg/m³							
bis-Chloromethyl ether $(CH_2Cl)_2O$ 542-88-1 KN1575000	BCME bis-CME Chloromethyl ether Dichlorodimethyl ether, Dichloromethyl ether, Oxybis(chloromethane)	NIOSH Ca See Appendix A OSHA [1910 1006] See Appendix B	Ca [N.D.]	Colorless liquid with a suffocating odor	MW 115.0 BP 223°F Sol Reacts Fl.P. <66°F IP ? Sp Gr 1.32 Class IB Flammable Liquid	VP (77°F) 30 mm FRZ -43°F UEL ? LEL ?	Acids, water [Note: Reacts with water to form hydrochloric acid & formaldehyde]	Imp. Reagent, GC/ECD, OSHA [#10]
2249 55	1 ppm = 4.78 mg/m³							

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	Prevent skin contact	NIOSH ✱ SCBAF PD PP/SAF PD PP ASCBA Escape: GMFOVH/E/SCBAE	Inh Abs Ing Con	Irrit eyes, chloracne, liver damage, repro effects; [carc]	Eye Skin Breath Swallow Immed Soap wash immed Resp support Medical attention immed	Skin, eyes, liver, repro sys [in animals: tumors of the pituitary gland & liver, leukemia]
[Chlorodiphenyl (42% chlorine)]						
Skin:	Prevent skin contact	NIOSH ✱ SCBAF PD PP/SAF PD PP ASCBA Escape: GMFOVH/E/SCBAE	Inh Abs Ing Con	Irrit eyes, chloracne; liver damage, repro effects; [carc]	Eye Skin Breath Swallow Immed Soap wash immed Resp support Medical attention immed	Skin, eyes, liver, repro sys [in animals: tumors of the pituitary gland & liver, leukemia]
[Chlorodiphenyl (54% chlorine)]						
Skin:	Prevent skin contact	NIOSH ✱ SCBAF PD PP/SAF PD PP ASCBA Escape: GMFOVH/E/SCBAE	Inh Abs Ing Con	Irrit eyes, skin, dizz, mental dullness, nau, conf; head, fig, anes, enlarged liver; [carc]	Eye Skin Breath Swallow Immed Soap wash prompt Resp support Medical attention immed	Liver, kidneys, heart, eyes, skin, CNS [in animals: liver & kidney cancer]
[Chloroform]						
Skin:	Prevent skin contact	NIOSH ✱ SCBAF PD PP/SAF PD PP ASCBA Escape: GMFOVH/E/SCBAE	Inh Abs Ing Con	Irrit eyes, skin, muc memb, resp sys; pulm congestion, edema, com damage, nec, dechr pulm function, cough, dysp, wheez, blood-stained sputum, bronchial secretions; [carc]	Eye Skin Breath Swallow Immed Soap wash immed Resp support Medical attention immed	Eyes, skin, resp sys [lung cancer]
[Di-Chloromethyl ether]						

Chemical name, structural formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Chloromethyl methyl ether <chem>CH3OCH2Cl</chem> 107-30-2 KN6650000	Chlorodimethyl ether. Chloromethoxymethane. CMME. Dimethylchloroether. Methylchloromethyl ether	NIOSH Ca See Appendix A OSHA(1910 1006) See Appendix B	Ca [N.D.]	Colorless liquid with an irritating odor.	MW: 80.5 BP: 138°F Sol: Reacts Fl P(oc): 32°F IP: 10.25 eV	VP(70°F): 192 mm FRZ: -154°F UEL: ? LEL: ?	Water [Note: Reacts with water to form hydrochloric acid & formaldehyde]	Imp. Hexane, GC/ECD, NI1 [P&CAM #220]
1239 57	1 ppm = 3.35 mg/m ³				Sp Gr: 1.06 Class IB Flammable Liquid			
1-Chloro-1-nitropropane <chem>CH3CH2CHClNO2</chem> 600-25-9 TX5075000	Korax® Larstan®	NIOSH 2 ppm (10 mg/m ³) OSHA† 20 ppm (100 mg/m ³)	100 ppm	Colorless liquid with an unpleasant odor [fungicide]	MW: 123.8 BP: 289°F Sol: 0.5% Fl P(oc): 144°F IP: 9.90 eV	VP(77°F): 6 mm FRZ: ? UEL: ? LEL: ?	Strong oxidizers, acids	Chrom-108, Ethyl acetate, GC/FID, II(5) [#S211]
	1 ppm = 5.14 mg/m ³				Sp Gr: 1.21 Class IIIA Combustible Liquid			
Chloropentafluoroethane <chem>CClF2CF3</chem> 78-18-3 KH7877800	Fluorocarbon-115, Freon® 115, Genatron® 115, Halocarbon 115, Monochloropentafluoroethane	NIOSH 1000 ppm (8320 mg/m ³) OSHA† none	N.D.	Colorless gas with a slight, ethereal odor. [Note: Shipped as a liquefied compressed gas.]	MW: 154.5 BP: -38°F Sol(77°F): 0.006% Fl.P: NA IP: 12.98 eV	VP(70°F): 7.3 atm FRZ: -223°F UEL: NA LEL: NA	Alkalis, alkaline earth metals (e.g., aluminum powder, sodium, potassium, zinc)	None available
1020 12	1 ppm = 6.42 mg/m ³				RGasD: 5.65 Nonflammable Gas			
Chloropicrin <chem>CCl3NO2</chem> 76-06-2 PB6300000 1580 56 1583 56 (mixture) 2929 57 (flammable mixture)	Nitrochloroform, Nitrotrichloromethane, Trichloronitromethane	NIOSH/OSHA 0.1 ppm (0.7 mg/m ³)	2 ppm	Colorless to faint- yellow, oily liquid with an intensely irritating odor [pesticide]	MW: 164.4 BP: 234°F Sol: 0.2% Fl.P: NA IP: ?	VP: 18 mm FRZ: -93°F UEL: NA LEL: NA	Strong oxidizers [Note: The material may explode when heated under confinement.]	None available
	1 ppm = 6.83 mg/m ³				Sp Gr: 1.66 Noncombustible Liquid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, skin,	Eye	Eyes, skin, resp sys
Eyes:	Prevent eye contact	4 SCBAF PD PP/SAF PD PP ASCBA	ing	muc memb, pulm	Skin	[in animals: skin
Wash skin:	When contam/Daily	Escape GMFOV/SCBAE	Con	edema, pulm congestion, pneu, skin burns, nec, cough, wheez, pulm congestion, blood stained sputum, low-wgt, bronchial secretions, [canc]	Breath	& lung cancer]
Remove:	When wet (flamm)				Swallow	
Change:	Daily					
Provide:	Eyewash, Quick drench					
[Chloromethyl methyl ether]						
Skin:	Prevent skin contact	NIOSH	Inh	In animals: irrit eyes,	Eye	Resp sys, liver,
Eyes:	Prevent eye contact	20 ppm: SA*	ing	pulm edema, liver, kidney,	Skin	kidneys, CVS, eyes
Wash skin:	When contam	50 ppm: SA CF*/PAPROV*	Con	heart damage	Breath	
Remove:	When wet or contam	100 ppm: CCRFOV/GMFOV/PAPRTOV*/			Swallow	
Change:	N.R.	SCBAF/SAF				
		5 SCBAF PD PP/SAF PD PP ASCBA				
		Escape GMFOV/SCBAE				
[1-Chloro-1-nitropropane]						
Skin:	Frostbite	TBAL	Inh	Dysp; dizz, lncn, narco;	Eye:	Skin, CNS, CVS
Eyes:	Frostbite		Con	nau, vomit; heart palp,	Skin:	
Wash skin:	N.R.		(liq)	card arrhy, asphy;	Breath:	
Remove:	N.R.			liq: frostbite, derm		
Change:	N.R.					
Provide:	Frostbite					
[Chloropentafluoroethane]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin, resp	Eye	Eyes, skin, resp sys
Eyes:	Prevent eye contact	2 ppm: SA, CF*/PAPROV*/CCRFOV/	ing	sys lac, cough, pulm	Skin	
Wash skin:	When contam	GMFOV/SCBAF/SAF	Con	edema, nau, vomit	Breath	
Remove:	When wet or contam	5 SCBAF PD PP/SAF PD PP ASCBA			Swallow	
Change:	N.R.	Escape GMFOV/SCBAE				
Provide:	Eyewash, Quick drench					
[Chloropicrin]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL F.P., IP, Sp. Gr., flammability	VP, FRZ UEL, LEL		
Is-Chloroprene $\text{CH}_2=\text{CClCH}=\text{CH}_2$ 126-99-8 E19625000	2-Chloro-1,3-butadiene, Chlorobutadiene, Chloroprene	NIOSH Ca [300 ppm] See Appendix A C 1 ppm (3.6 mg/m ³) (15-min) OSHA† 25 ppm (90 mg/m ³) (skin)	Ca [300 ppm]	Colorless liquid with a pungent, ether-like odor	MW: 88.5 BP: 139°F Sol: Slight F.P. -4°F IP: 8.79 eV	VP: 188 mm FRZ: -153°F UEL: 20.0% LEL: 4.0%	Peroxides & other oxidizers [Note: Polymerizes at room temperature unless inhibited with antioxidants]	Char. CS, GC/FID, IR [#1002]
1991 30 (inhibited)	1 ppm = 3.68 mg/m ³				Sp Gr: 0.96 Class IB Flammable Liquid			
o-Chlorostyrene $\text{ClC}_6\text{H}_4\text{CH}=\text{CH}_2$ 2039-87-4 WL4160000	2-Chlorostyrene, ortho-Chlorostyrene, 1-Chloro-2-ethenylbenzene	NIOSH 50 ppm (285 mg/m ³) ST 75 ppm (428 mg/m ³) OSHA† none	N.D.	Colorless liquid	MW: 138.6 BP: 372°F Sol: Insoluble F.P.: 138°F IP: ?	VP(77°F): 0.96 mm FRZ: -82°F UEL: ? LEL: ?	None reported	None available
	1 ppm = 5.78 mg/m ³				Sp.Gr: 1.10 Class II Combustible Liquid			
o-Chlorotoluene $\text{ClC}_6\text{H}_4\text{CH}_3$ 95-49-8 X59000000	1-Chloro-2-methylbenzene, 2-Chloro-1-methylbenzene, o-Tolyl chloride	NIOSH 50 ppm (250 mg/m ³) ST 75 ppm (375 mg/m ³) OSHA† none	N.D.	Colorless liquid with an aromatic odor.	MW: 126.6 BP: 320°F Sol(77°F): 0.005% F.P.: 96°F IP: 8.83 eV	VP(77°F): 4 mm FRZ: -31°F UEL: ? LEL: ?	Acids, alkalis, oxidizers, reducing materials, water	None available
2238 27	1 ppm = 5.26 mg/m ³				Sp Gr: 1.08 Class IC Flammable Liquid			
2-Chloro-6-trichloro- methylpyridine $\text{ClC}_5\text{H}_4\text{NCCl}_3$ 1929-82-4 US7525000	2-Chloro-6-(trichloro- methyl)pyridine, Nitrapyrin, Nerve 6; 2,2,2,6-Tetrachloro- 2-picolone	NIOSH 10 mg/m ³ (total) ST 20 mg/m ³ (total) 5 mg/m ³ (resp) OSHA 15 mg/m ³ (total) 5 mg/m ³ (resp)	N.D.	Colorless or white, crystalline solid with a mild, sweet odor.	MW: 230.9 BP: ? Sol: Insoluble F.P.: ? IP: ?	VP(77°F): 0.003 mm MLT: 145°F UEL: ? LEL: ?	Aluminum, magnesium [Note: Emits oxides of nitrogen and chloride ion when heated to decomposition.]	None available
					Sp Gr: ? Combustible Solid [Explosive]			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 6)
Skin:	Prevent skin contact	NIOSH M SCBAF PD PP/SAF PD PP ASCBA Escape GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, skin, resp sys; ner. irrt; derm alopecia; repro effects; [canc]	Eye:	Eyes, skin, resp sys, repro sys [lung & skin cancer]
Wash skin:	When contam				Skin	
Remove:	When wet (flam)				Breath	
Change:	N.R.				Swallow	
Provide:	Eyewash, Quick drench				Trimmed Soap wash immed Resp support Medical attention immed	
[p-Chloroprene]						
Skin:	Prevent skin contact	TBAL	Inh Ing Con	In animals: Irrit eyes, skin; hemat. prot. acidosis; enlarged liver, jaun	Eye:	Eyes, skin, liver, kidneys, CNS, PNS
Eyes:	Prevent eye contact				Skin:	
Wash skin:	When contam				Breath:	
Remove:	When wet or contam				Swallow:	
Change:	N.R.				Trimmed Soap wash immed Resp support Medical attention immed	
[o-Chlorostyrene]						
Skin:	Prevent skin contact	TBAL	Inh Abs Ing Con	Irrit eyes, skin, muc memb; derm; drow, inco, anes; cough; liver, kidney inj	Eye:	Eyes, skin, resp sys, CNS, liver, kidneys
Eyes:	Prevent eye contact				Skin:	
Wash skin:	When contam				Breath:	
Remove:	When wet (flam)				Swallow:	
Change:	N.R.				Trimmed Soap wash immed Resp support Medical attention immed	
Provide:	Eyewash					
[o-Chlorotoluene]						
Skin:	Prevent skin contact	TBAL	Inh Abs Ing Con	No adverse effects noted in ingestion studies with animals.	Eye:	Eyes, skin
Eyes:	Prevent eye contact				Skin:	
Wash skin:	When contam				Breath:	
Remove:	When wet or contam				Swallow:	
Change:	Daily				Trimmed Soap wash immed Resp support Medical attention immed	
[2-Chloro-4-trichloromethyl pyridine]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL F.P., IP, Sp. Gr., flammability	VP, FRZ UEL, LEL		
Chlorpyrifos $C_8H_{11}Cl_2NO_3PS$ 2921-88-2 TF8300000	Chlorpyrifos-ethyl; O,O-Diethyl O-3,5,6- trichloro-2-pyridyl phosphorothioate; Dursban®	NIOSH 0.2 mg/m ³ ST 0.6 mg/m ³ [skin] OSHA† none	N.D.	Colorless to white, crystalline solid with a mild, mercaptan-like odor. [pesticide] [Note: Commercial formulations may be combined with combustible liquids.]	MW: 350.8 BP: 320°F (Decomposes) Sol: 0.0002% F.P.: ? IP: ? Sp.Gr: 1.40 (Liquid at 110°F) Combustible Solid	VP: 0.00002 mm MLT: 108°F UEL: ? LEL: ?	Strong acids, caustics, amines [Note: Corrosive to copper & brass.]	Filter; none; Grav; # [0500, Nuisance Dust (total)]
2783 66								
Chromic acid and chromates CrO_3 (acid)	Chromic acid (CrO_3) Chromic anhydride, Chromic oxide, Chromium(VI) oxide (1:3), Chromium trioxide	NIOSH (as Cr) Ca See Appendix A 0.001 mg/m ³ See Appendix C	Ca [15 mg/m ³ as Cr(VI)]	CrO_3 ; Dark-red, odorless flakes or powder. [Note: Often used in an aqueous solution (H_2CrO_4).]	MW 100.0 BP 482°F (Decomposes) Sol: 63% F.P. NA IP NA Sp. Gr: 2.70 (CrO_3) CrO_3 Noncombustible Solid, but will accelerate the burning of combustible materials	VP: Very low MLT: 387°F UEL: NA LEL: NA	Combustible, organic, or other readily oxidizable materials (paper, wood, sulfur, aluminum, plastics, etc.), corrosive to metals	Filter, Reagent, Vis. III # [7600, Hexavalent Chromium]
1333-82-0 (CrO_3) GB6850000 (CrO_3) 1755 60 (acid, soln.) 1463 42 (acid, solid)	Synonyms of chromates (i.e., chromium(VI) compounds) such as zinc chromate vary depending upon the specific compound.	OSHA (as CrO_3) 0.1 mg/m ³ See Appendix C						
Chromium(II) compounds (as Cr)	Synonyms vary depending upon the specific chromium(II) compound. [Note: Chromium(II) compounds include soluble chromous salts.]	NIOSH/OSHA 0.5 mg/m ³ See Appendix C	250 mg/m ³ [as Cr(II)]	Appearance and odor vary depending upon the specific chromium(II) compound.	Properties vary depending upon the specific chromium(II) compound.	Varies	Filter, Acid, AAS, III # [7024, Chromium]	
Chromium(III) compounds (as Cr)	Synonyms vary depending upon the specific chromium(III) compound. [Note: Chromium(III) compounds include soluble chromic salts.]	NIOSH/OSHA 0.5 mg/m ³ See Appendix C	25 mg/m ³ [as Cr(III)]	Appearance and odor vary depending upon the specific chromium(III) compound.	Properties vary depending upon the specific chromium(III) compound.	Varies	Filter, Acid, AAS, II # [7024, Chromium]	

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)		Target organs (See Table 6)
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet or contam Daily	TBAL	Inh Abs Ing Con	Wheez, lar spasms, saliv; bluish lips, skin; miosis, blurred vision; nau, vomit, abdom cramps, diar	Eye: Skin: Breath: Swallow:	Irr immed Soap wash immed Resp support Medical attention immed	Resp sys, CNS, PNS, plasma chol
[Chlorpyrifos]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam Daily Eyewash, Quick drench	NIOSH X: SCBAF PD, PP/SAF PD, PP ASCBA Escape: HIEF/SCBAE	Inh Ing Con	Irrit resp sys, nasal septum perf, liver, kidney damage, leucyt, leupan, monocyt, eosin, eye inj, conj, skin ulcer, sens derm, [canc]	Eye: Skin: Breath: Swallow:	Irr immed Soap wash immed Resp support Medical attention immed	Blood, resp sys, liver, kidneys, eyes, skin [lung cancer]
[Chromic acid and chromates]							
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R.	NIOSH/OSHA 2.5 mg/m ³ DM* 5 mg/m ³ DMXQ/SA* 12.5 mg/m ³ SA CF*/PAPRDM* 25 mg/m ³ HIEF/PAPRTHIE*/SCBAF/SAF 250 mg/m ³ SAF PD, PP § SCBAF PD, PP/SAF PD, PP ASCBA Escape: HIEF/SCBAE	Inh Ing Con	Irrit eyes; sens derm	Eye: Skin: Breath: Swallow:	Irr immed Water flush prompt Resp support Medical attention immed	Eyes, skin
[Chromium(VI) compounds (as Cr)]							
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R.	NIOSH/OSHA 2.5 mg/m ³ DM* 5 mg/m ³ DMXQ/SA* 12.5 mg/m ³ SA CF*/PAPRDM* 25 mg/m ³ HIEF/PAPRTHIE*/SCBAF/SAF § SCBAF PD, PP/SAF PD, PP ASCBA Escape: HIEF/SCBAE	Inh Ing Con	Irrit eyes; sens derm	Eye: Skin: Breath: Swallow:	Irr immed Water flush prompt Resp support Medical attention immed	Eyes, skin
[Chromium(III) compounds (as Cr)]							

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P., IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Chromium metal Cr 7440-47-3 GB4200000	Chrome Chromium	NIOSH 0.5 mg/m ³ See Appendix C OSHA* 1 mg/m ³ See Appendix C [Note: The PEL also applies to insoluble chromium salts.]	250 mg/m ³ (as Cr)	Blue-white to steel-gray; lustrous; brittle, hard; odorless solid	MW: 52.0 BP: 4786°F Sol: Insoluble Fl.P.: NA IP: NA	VP: 0 mm (approx) MLT: 3452°F UEL: NA LEL: NA	Strong oxidizers (such as hydrogen peroxide), alkalis	Filter, Acid, AAS, IR [#7024]
Chromyl chloride Cr(OCl) ₂ 14977-61-8 GB5775000	Chlorochromic anhydride, Chromic oxychloride, Chromium chloride oxide, Chromium dichloride dioxide, Chromium dioxide dichloride, Chromium dioxide chloride, Chromium oxychloride, Dichlorodioxochromium	NIOSH Ca See Appendix A See Appendix C 0.001 mg Cr(VI)/m, OSHA none	Ca [N.D.]	Deep-red liquid with a musty, burning, acid odor. [Note: Fumes in moist air.]	MW: 154.9 BP: 243°F Sol: Reacts Fl.P.: NA IP: 12.60 eV	VP: 20 mm FRZ: -142°F UEL: NA LEL: NA	Water, combustible substances, halides, phosphorus, turpentine [Note: Reacts violently in water; forms chromic acid, chromic chloride, hydrochloric acid & chlorine. Corrodes common metals.]	None available
1758 38	1 ppm = 6.44 mg/m ³				Sp.Gr.(77°F): 1.91 Noncombustible Liquid, but a powerful oxidizer.			
Clopidol C ₈ H ₆ Cl ₂ NO 2971-90-6 UU7711500	Cayden®; 3,5-Dichloro-2,6-dimethyl- 4-pyridinol	NIOSH 10 mg/m ³ (total) ST 20 mg/m ³ (total) 5 mg/m ³ (resp) OSHA 15 mg/m ³ (total) 5 mg/m ³ (resp)	N.D.	White to light- brown, crystalline solid.	MW: 192.1 BP: ? Sol: Insoluble Fl.P.: NA IP: ?	VP: ? MLT: >608°F UEL: NA LEL: NA	None reported	Filter; none; Grav; IR [Nuisance Dust: #0500 (total), #0500 (resp)]
Coal dust GF8281000	Anthracite coal dust, Bituminous coal dust, Lignite coal dust	NIOSH See Appendix D OSHA† See Appendix C (Mineral Dusts)	N.D.	Dark-brown to black solid dispersed in air.	Properties vary depending upon the specific coal type.		None reported	Filter; none; Grav; IR [#0600, Nuisance Dust (resp) [Also #7500.]
1361 32					Combustible Solid; slightly explosive when exposed to flame.			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection -- maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 6)	First aid (See Table 6)	Target organs (See Table 6)
Skin:	N.R.	NIOSH	Inh	Irrit eyes, skin, lung	Eye:	Eye, skin, resp sys
Eyes:	N.R.	2.5 mg/m ³ DM*	Inh	fib (histologic)	Skin:	
Wash skin:	N.R.	5 mg/m ³ DMXSO*/SA*	Inh		Breath:	
Remove:	N.R.	12.5 mg/m ³ SA CF*/PAPRDM*	Con		Swallow:	
Change:	N.R.	25 mg/m ³ HIE/PAPRTHIE*/SCBAF/SAF				
		250 mg/m ³ SAF:PD,PP				
		5 SCBAF PD,PP/SAF PD,PP ASCBA				
		Escape: HIE/SCBAE				
[Chromium metal]						
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, skin, upper	Eye:	Eye, skin, resp sys
Eyes:	Prevent eye contact	5 SCBAF:PD,PP/SAF:PD,PP-ASCBA	Abs	resp sys; eye, skin burns	Skin:	[lung cancer]
Wash skin:	When contam	Escape: GMFOV/SCBAE	Inh		Breath:	
Remove:	When wet or contam		Con		Swallow:	
Change:	N.R.					
Provide:	Eyewash, Quick drench					
[Chromyl chloride]						
Skin:	N.R.	TBAL	Inh	Irrit eyes, skin, nose,	Eye:	Eye, skin, resp sys
Eyes:	N.R.		Con	throat; cough	Skin:	
Wash skin:	N.R.				Breath:	
Remove:	N.R.					
Change:	N.R.					
[Cuprous]						
Skin:	N.R.	TBAL	Inh	Chronic bron, deacr pulm	Breath:	Resp sys
Eyes:	N.R.			func, emphy		
Wash skin:	N.R.					
Remove:	N.R.					
Change:	N.R.					
[Coal dust]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL, FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Coal tar pitch volatiles 65996-93-2 GF8655000	Synonyms vary depending upon the specific compound (e.g., pyrene, phenanthrene, acridine, chrysene, anthracene & benzo(a)pyrene). [Note: NIOSH considers coal tar, coal tar pitch, and creosote to be coal tar products.]	NIOSH Ca 0.1 mg/m ³ (cyclohexane-extractable fraction) See Appendix A See Appendix C OSHA(1910.1002) 0.2 mg/m ³ (benzene-soluble fraction) See Appendix C	Ca [80 mg/m ³]	Black or dark- brown amorphous residue.	Properties vary depending upon the specific compound. Combustible Solids		Strong oxidizers	Filter; Benzene; Grav; II [#5023]
Cobalt metal dust & fume (as Co) Co 7440-48-4 GF8750000	Cobalt metal dust, Cobalt metal fume	NIOSH 0.05 mg/m ³ OSHA† 0.1 mg/m ³	20 mg/m ³ (as Co)	Odorless, silver- gray to black solid	MW: 58.9 BP: 5612°F Sol: Insoluble FLP: NA IP: NA Sp Gr: 8.92 Noncombustible Solid in bulk form, but finely divided dust will burn at high temperatures.	VP: 0 mm (approx) MLT: 2719°F UEL: NA LEL: NA	Strong oxidizers, ammonium nitrate	Filter; Acid; AAS; II [#7027]
Cobalt carbonyl (as Co) C ₅ Co ₂ O ₈ 10210-68-1 GG0300000	di- μ -Carbonylhexa- carbonyldicobalt, Cobalt octacarbonyl, Cobalt tetracarbonyl dimer, Dicobalt carbonyl, Dicobalt octacarbonyl, Octacarbonyldicobalt	NIOSH 0.1 mg/m ³ OSHA† none	N.D.	Orange to dark- brown, crystalline solid. [Note: The pure substance is white.]	MW: 341.9 BP: 126°F (Decomposes) Sol: Insoluble FLP: NA IP: 7 Sp. Gr: 1.87 Noncombustible Solid, but flammable carbon monoxide is emitted during decomposition.	VP: 0.7 mm MLT: 124°F UEL: NA LEL: NA	Air [Note: Decomposes on exposure to air or heat; stable in atmosphere of hydrogen & carbon monoxide.]	None available
Cobalt hydrocarbonyl (as Co) HCo(CO) ₃ 16842-03-8 GG0900000	Hydrocobalt tetracarbonyl, Tetracarbonylhydridocobalt, Tetracarbonylhydricobalt	NIOSH 0.1 mg/m ³ OSHA† none	N.D.	Gas with an offensive odor.	MW: 172.0 BP: 7 Sol: 0.05% FLP: NA (Gas) IP: 7 RGasD: 5.93 Flammable Gas	VP: >1 atm FRZ: -15°F UEL: 7 LEL: 7	Air [Note: Unstable gas that decomposes rapidly in air at room temperature to cobalt carbonyl & hydrogen.]	None available

1 ppm = 7.15 mg/m³

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)		Target organs (See Table 5)
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact Daily N.R. Daily	NIOSH § SCBAF PD PP/SAF PD PP ASCBA Escape GMFOVHE/SCBAE	Inh Con	Derm. bron. [canc]	Eye Skin Breath Swallow:	Irritated Soap wash immed Resp support Medical attention immed	Resp sys, skin, bladder, kidneys [lung, kidney & skin cancer]
[Coal tar pitch volatiles]							
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact N.R. When contam When wet or contam Daily	NIOSH 0.25 mg/m ³ DM ^a 0.5 mg/m ³ DMXSO ²² /DMFu ² SA ^a 1.25 mg/m ³ SA CF ² /PAPRODM ²² /PAPRODMFu ^a 2.5 mg/m ³ H ² F/SCBAF/SAF 20 mg/m ³ SAF PD PP § SCBAF PD PP/SAF PD PP ASCBA Escape H ² F/SCBAE	Inh Ing Con	Cough, dysp, wheez, decr pulm func, low-wgt, dem, diffuse nodular fib; resp hypersensitivity, asthma	Eye Skin Breath Swallow:	Irritated Soap wash Resp support Medical attention immed	Skin, resp sys
[Cobalt (dust and fume)]							
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet or contam Daily	TBAL	Inh Abs Ing Con	Irrit eyes, skin, muc memb; cough, decr pulm func, wheez, dysp; in animals: liver, kidney inf; pulm edema	Eye: Skin: Breath: Swallow:	Irritated Soap wash Resp support Medical attention immed	Eyes, skin, resp sys, blood, CNS
[Cobalt carbonyl (as Co)]							
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet or contam Daily	TBAL	Inh Con	In animals: irrit resp sys; dysp, cough, decr pulm func, pulm edema	Eye: Skin: Breath:	Irritated Soap wash Resp support	Eyes, skin, resp sys
[Cobalt hydrocarbonyl (as Co)]							

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL, Fl, P, IP, Sp, Gr, flammability	VP, FRZ, UEL, LEL		
Coke oven emissions GH0346000	Synonyms vary depending upon the specific constituent.	NIOSH Ca 0.5-0.7 mg/m ³ (total) (screening level) See Appendix A See Appendix C OSHA (1910.1028) 0.150 mg/m ³ (benzene-soluble fraction)	Ca [N.D.]	Emissions released during the carbonization of bituminous coal for the production of coke. [Note: See Appendix C for more information.]	Properties vary depending upon the constituent.		None reported	Filter; Benzene; Grav; II [#5023, Coal tar pitch volatiles]
Copper (dusts and mists) Cu 7440-50-8 GL5325000	Copper metal dusts, Copper metal mists	NIOSH*OSHA* 1 mg/m ³ [*Note: The REL and PEL also apply to other copper compounds (as Cu) except Copper fume.]	100 mg/m ³ (as Cu)	Reddish lustrous, malleable, odorless solid	MW 63.5 BP 4703°F Sol Insoluble Fl P NA IP NA	VP 0 mm (approx) MLT 1981°F UEL NA LEL NA	Oxidizers alkalis, sodium azide, acetylene	Filter, Acid, AAS, II [#7029]
Copper fume (as Cu) CuO/Cu 1317-38-0 (CuO) GL7900000 (CuO)	CuO Black copper oxide, Copper monoxide, Copper(II) oxide, Cupric oxide Cu Copper fume [Note: Also see specific listing for Copper (dusts and mists).]	NIOSH-OSHA 0.1 mg/m ³	100 mg/m ³ (as Cu)	Finely divided black particulate dispersed in air [Note: Exposure may occur in copper & brass plants and during the welding of copper alloys.]	MW 79.5 BP Decomposes Sol Insoluble Fl P NA IP NA	VP 0 mm (approx) MLT 1879°F (Decomposes) UEL NA LEL NA	CuO Acetylene, zincium	Filter, Acid, AAS, III [#7029]
					[Note: See Copper (dusts and mists) for properties of Copper metal.] Sp Gr 6.4 (CuO) CuO Noncombustible Solid			
Cotton dust (raw) GN2275000	Raw cotton dust	NIOSH <0.200 mg/m ³ See Appendix C OSHA (Z-1-A & 1910.1043) See Appendix C	100 mg/m ³	Colorless, odorless solid	MW ? BP Decomposes Sol Insoluble Fl P NA IP NA	VP 0 mm (approx) MLT ? Decomposes UEL NA LEL NA	Strong oxidizers	Vertical ekul, none, Grav OSHA {1910.1043}
					Sp Gr ? Combustible Solid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, resp sys;	Eye:	Skin, resp sys,
Eyes:	Prevent eye contact	4 SCBAF PD PP/SAF PD PP/ASCBA	Con	cough, dysp, wheez;	Breath:	urinary sys
Wash skin:	Daily	Escape: GMFOVHIE/SCBAE		[canc]	Resp support	[skin, lung, kidney & bladder cancer]
Remove:	N.R.					
Change:	Daily					
[Coke oven emissions]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, nose, pharynx;	Eye	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	5 mg/m ³ DM*	Ing	nasal perf; metallic	Skin	liver, kidneys
Wash skin:	When contam	10 mg/m ³ DMXSG**/SA*	Con	taste, derm;	Breath:	(incr risk with
Remove:	When wet or contam	25 mg/m ³ SA CF/PAPRDM*		in animals lung, liver,	Swallow:	Wilson's disease)
Change:	Daily	50 mg/m ³ HIEF/PAPRTHIE/SCBAF/SAF		kidney damage, anemia	imed	
		100 mg/m ³ SAF PD PP				
		6 SCBAF PD PP/SAF PD PP/ASCBA				
		Escape: HIEF/SCBAE				
[Copper (dusts and mists)]						
Skin:	N.R.	NIOSH/OSHA	Inh	Irrit eyes, upper resp sys;	Breath:	Eyes, skin, resp sys
Eyes:	N.R.	1 mg/m ³ DMFu/SA	Con	metal fume fever, chills,	Resp support	(incr risk with
Wash skin:	N.R.	2.5 mg/m ³ SA CF/PAPRDMFu		muscle ache, nau, fever, dry		Wilson's disease)
Remove:	N.R.	5 mg/m ³ HIEF/SAT CF/PAPRTHIE/		throat, cough, weak, lass,		
Change:	N.R.	SCBAF/SAF		metallic or sweet taste,		
		100 mg/m ³ SAF PD PP		discoloration skin, hair		
		6 SCBAF PD PP/SAF PD PP/ASCBA				
		Escape: HIEF/SCBAE				
[Copper fume (as Cu)]						
Skin:	N.R.	NIOSH	Inh	Byssinosis: chest tight,	Breath:	CVS, resp sys
Eyes:	N.R.	1 mg/m ³ D		cough, wheez, dysp,	Fresh air	
Wash skin:	N.R.	2 mg/m ³ DXSGHIE/SA		decr FEV, bron, mal,		
Remove:	N.R.	5 mg/m ³ SA CF/PAPRD		fever, chills, upper resp		
Change:	N.R.	10 mg/m ³ HIEF/SAT CF/PAPRTHIE/		symptoms after initial		
		SCBAF/SAF		exposure		
		100 mg/m ³ SA PD PP				
		6 SCBAF PD PP/SAF PD PP/ASCBA				
		Escape: HIEF/SCBAE				
[Cotton dust (raw)]						

Chemical name, structural formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA, unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl, P, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Crag® herbicide $C_8H_7Cl_2OCH_2CH_2OSO_3Na$ 136-78-7 KK4900000	Crag® herbicide No. 1, 2-(2,4-dichlorophenoxy)- ethyl sodium sulfate, Sesone	NIOSH 10 mg/m ³ (total) 5 mg/m ³ (resp) OSHA† 15 mg/m ³ (total) 5 mg/m ³ (resp)	500 mg/m ³	Colorless to white crystalline, odorless solid. [herbicide]	MW 309.1 BP Decomposes Sol 77°F 25% Fl P NA IP ? Sp Gr 1.70 Noncombustible Solid	VP 0.1 mm MLT 473°F (Decomposes) UEL NA LEL NA	Strong oxidizers, acids	Filter, Water, Vie, II(5) [#5356]
o-Cresol $CH_3C_6H_4OH$ 95-48-7 GO8300000	ortho-Cresol, 2-Cresol, o-Cresylic acid, 1-Hydroxy-2-methylbenzene, 2-Hydroxytoluene, 2-Methyl phenol	NIOSH 2.3 ppm (10 mg/m ³) OSHA 5 ppm (22 mg/m ³) [skin]	250 ppm	White crystals with a sweet, tarry odor. [Note: A liquid above 88°F.]	MW 108.2 BP 376°F Sol 2% Fl P 178°F IP 8.93 eV Sp Gr 1.05 Combustible Solid Class IIIA Combustible Liquid	VP(77°F): 0.29 mm MLT 88°F UEL ? LEL(300°F) 14%	Strong oxidizers, acids	Si gel, Acetone, GC/FID, III [#2001]
m-Cresol $CH_3C_6H_4OH$ 108-39-4 GO6125000	meta-Cresol, 3-Cresol, m-Cresylic acid, 1-Hydroxy-3-methylbenzene, 3-Hydroxytoluene, 3-Methyl phenol	NIOSH 2.3 ppm (10 mg/m ³) OSHA 5 ppm (22 mg/m ³) [skin]	250 ppm	Colorless to yellowish liquid with a sweet, tarry odor. [Note: A solid below 54°F.]	MW 108.2 BP 397°F Sol 2% Fl P 187°F IP 8.96 eV Sp Gr 1.03 Class IIIA Combustible Liquid	VP(77°F): 0.14 mm MLT 84°F UEL ? LEL(302°F) 1%	Strong oxidizers, acids	Si gel, Acetone, GC/FID, III [#2001]
p-Cresol $CH_3C_6H_4OH$ 106-44-5 GO6475000	para-Cresol, 4-Cresol, p-Cresylic acid, 1-Hydroxy-4-methylbenzene, 4-Hydroxytoluene, 4-Methyl phenol	NIOSH 2.3 ppm (10 mg/m ³) OSHA 5 ppm (22 mg/m ³) [skin]	250 ppm	Crystalline solid with a sweet, tarry odor. [Note: A liquid above 95°F.]	MW 108.2 BP 395°F Sol 2% Fl P 187°F IP 8.97 eV Sp Gr 1.04 Combustible Solid Class IIIA Combustible Liquid	VP(77°F): 0.11 mm MLT 95°F UEL ? LEL(302°F) 1%	Strong oxidizers, acids	Si gel, Acetone, GC/FID, III [#2001]
2076 55	1 ppm = 4.50 mg/m ³							

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily		NIOSH 50 mg/m ³ DM 100 mg/m ³ DMXSO/SA 250 mg/m ³ SA CF/PAPRDM 500 mg/m ³ HIEF/PAPRTHIE/SAT:CF/Y SCBAF/SAF § SCBAF PD, PP/SAF PD, PP ASCBA Escape: HIEF/SCBAE	Inh Ing Con	Irrit eyes, skin; liver, kidney damage; in animals: CNS effects, convuls	Eye: Skin: Breath: Swallow: Irr immed Water wash prompt Resp support Medical attention immed	Eyes, skin, CNS, liver, kidneys
[Crag® herbicide]						
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily Provide: Eyewash, Quick drench		NIOSH 23 ppm: CCROVDM/SA 57.5 ppm: SA CF/PAPROVDM 115 ppm: CCRFOVHIE/GMFOVHIE/PAPRTHIE/SAT:CF/Y SCBAF/SAF 250 ppm: SAF PD, PP § SCBAF PD, PP/SAF PD, PP ASCBA Escape: GMFOVHIE/SCBAE	Inh Abs Ing Con	Irrit eyes, skin, muc memb; CNS effects: conf, depres, resp fail, dysp, irreg rapid resp, weak pulse, eye, skin burns; derm, lung, liver, kidney, pancreas damage	Eye: Skin: Breath: Swallow: Irr immed Soap wash immed Resp support Medical attention immed	Eyes, skin, resp sys, CNS, liver, kidneys, pancreas, CVS
[p-Cresol]						
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily Provide: Eyewash, Quick drench		NIOSH 23 ppm: CCROVDM/SA 57.5 ppm: SA CF/PAPROVDM 115 ppm: CCRFOVHIE/GMFOVHIE/PAPRTHIE/SAT:CF/Y SCBAF/SAF 250 ppm: SAF PD, PP § SCBAF PD, PP/SAF PD, PP ASCBA Escape: GMFOVHIE/SCBAE	Inh Abs Ing Con	Irrit eyes, skin, muc memb; CNS effects: conf, depres, resp fail, dysp, irreg rapid resp, weak pulse, eye, skin burns; derm, lung, liver, kidney, pancreas damage	Eye: Skin: Breath: Swallow: Irr immed Soap wash immed Resp support Medical attention immed	Eyes, skin, resp sys, CNS, liver, kidneys, pancreas, CVS
[m-Cresol]						
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily Provide: Eyewash, Quick drench		NIOSH 23 ppm: CCROVDM/SA 57.5 ppm: SA CF/PAPROVDM 115 ppm: CCRFOVHIE/GMFOVHIE/PAPRTHIE/SAT:CF/Y SCBAF/SAF 250 ppm: SAF PD, PP § SCBAF PD, PP/SAF PD, PP ASCBA Escape: GMFOVHIE/SCBAE	Inh Abs Ing Con	Irrit eyes, skin, muc memb; CNS effects: conf, depres, resp fail, dysp, irreg rapid resp, weak pulse, eye, skin burns; derm, lung, liver, kidney, pancreas damage	Eye: Skin: Breath: Swallow: Irr immed Soap wash immed Resp support Medical attention immed	Eyes, skin, resp sys, CNS, liver, kidneys, pancreas, CVS

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Crotonaldehyde $\text{CH}_3\text{CH}=\text{CHCHO}$ 4170-30-3 GP9499000	2-Butenal δ-Methylacrolein , Propylene aldehyde	NIOSH 2 ppm (6 mg/m ³) See Appendix C (Aldehydes) OSHA 2 ppm (6 mg/m ³)	50 ppm	Water-white liquid with a suffocating odor. [Note: Turns pale- yellow on contact with air.]	MW: 70.1 BP: 219°F Sol: 18% FLP: 45°F IP: 9.73 eV	VP: 19 mm FRZ: -101°F UEL: 15.5% LEL: 2.1%	Caustics, ammonia, strong oxidizers, nitric acid, amines [Note: Polymerization may occur at elevated tempera- tures, such as in fire conditions.]	Bub. Reagent; PLR; II [P&CAM #285]
1143 28 (inhibited)	1 ppm = 2.91 mg/m ³				Sp. Gr: 0.87 Class IB Flammable Liquid			
Crufomate $\text{C}_{11}\text{H}_{14}\text{ClNO}_2\text{P}$ 299-86-5 TB3850000	4-t-Butyl-2-chlorophenyl methylmethylphos- phoramidate , Dowco® 132, Ruselene®	NIOSH 5 mg/m ³ ST 20 mg/m ³ OSHA† none	N.D.	White, crystalline solid in pure form. (pesticide) [Note: Commercial product is a yellow oil.]	MW: 291.7 BP: Decomposes Sol: Insoluble FLP: ? IP: ?	VP(243°F): 0.01 mm MLT: 140°F UEL: ? LEL: ?	Strongly alkaline & strongly acidic media [Note: Unstable over long periods in aqueous preparations or above 140°F.]	Filter; none; Grav; II [#0500, Nuisance Dust (total)]
Cumene C_9H_{10} 98-82-8 GR8575000	Cumol, Isopropyl benzene, 2-Phenyl propane	NIOSH/OSHA 50 ppm (245 mg/m ³) (skin)	900 ppm [LEL]	Colorless liquid with a sharp, penetrating, aromatic odor.	MW: 120.2 BP: 306°F Sol: Insoluble FLP: 96°F IP: 8.75 eV	VP: 8 mm FRZ: -141°F UEL: 6.5% LEL: 0.9%	Oxidizers, nitric acid, sulfuric acid [Note: Forms cumene hydroperoxide upon long exposure to air.]	Char. CS, GC/MS; II [#1501, Aromatic Hydro- carbons]
1918 28	1 ppm = 5.00 mg/m ³				Sp. Gr: 0.86 Class IC Flammable Liquid			
Cyanamide NH_2CN 420-04-2 GS9960000	Amidocyanogen, Carbimide, Carbodiimide , Cyanogen nitride , Hydrogen cyanamide [Note: Cyanamide is also a synonym for Calcium cyanamide.]	NIOSH 2 mg/m ³ OSHA† none	N.D.	Crystalline solid.	MW: 42.1 BP: 500°F (Decomposes) Sol(58°F): 78% FLP: 238°F IP: 10.65 eV	VP: ? MLT: 113°F UEL: ? LEL: ?	Above 104°F: Moisture, acids, or alkalis; 1,2-phenylene-diamine salts [Note: Polymerization may occur on evaporation of aqueous solutions.]	Filter; none; Grav; II [#0500, Nuisance Dust (total)]
					Sp. Gr: 1.28 Combustible Solid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, resp sys.	Eye	Eyes, skin, resp sys
Eyes:	Prevent eye contact	20 ppm: CCR/OV/SA*	Inh	in animals: dysp, pulm	Skin	
Wash skin:	When contam	50 ppm: SA:CF/PAPROV/CCRFOV/	Ing	edema, vtl skin	Breath:	
Remove:	When wet (flamms)	GMFOV/SCBAF/SAF	Con		Swallow	
Change:	N.R.	§ SCBAF PD PP/SAF PD PP ASCBA				
Provide:	Eyewash, Quick drench	Escape GMFOV/SCBAE				
[Crotonaldehyde]						
Skin:	Prevent skin contact	TBAL	Inh	Irrit eyes, skin, resp	Eye:	Eyes, skin, resp sys,
Eyes:	Prevent eye contact		Abs	sys; wheez, dysp; blurred	Skin:	blood chol
Wash skin:	When contam		Ing	vision, lac; sweat; abdom	Breath:	
Remove:	When wet or contam		Con	cramps, diarr, nau, anor	Swallow:	
Change:	Daily					
[Crotomate]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin, muc memb,	Eye	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	500 ppm: CCR/OV/SA*	Abs	derm, head, narco, coma	Skin:	CNS
Wash skin:	When contam	900 ppm: SA:CF/PAPROV/CCRFOV/	Ing		Breath:	
Remove:	When wet (flamms)	GMFOV/SCBAF/SAF	Con		Swallow:	
Change:	N.R.	§ SCBAF PD PP/SAF PD PP ASCBA				
		Escape GMFOV/SCBAE				
[Cumene]						
Skin:	Prevent skin contact	TBAL	Inh	Irrit eyes, skin, resp	Eye:	Eyes, skin, resp sys,
Eyes:	Prevent eye contact		Abs	sys; eye, skin burns;	Skin:	CNS
Wash skin:	When contam		Ing	miosis, saliv, lac, twitch;	Breath:	
Remove:	When wet or contam		Con	Antabuse-like effects	Swallow:	
Change:	Daily					
Provide:	Eyewash, Quick drench					
[Cyanamide]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWAs unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL, F.P., IP, Sp. Gr., flammability	VP, FRZ, UEL, LEL		
Cyanogen NCCN 460-19-5 GT1925000	Carbon nitride, Dicyan, Dicyanogen, Ethanedinitrile, Oxalonitrile	NIOSH 10 ppm (20 mg/m ³) OSHA† none	N.D.	Colorless gas with a pungent, almond-like odor. [Note: Shipped as a liquefied compressed gas. Forms cyanide in the body.]	MW: 52.0 BP: -6°F Sol: 1% F.P.: NA (Gas) IP: 13.57 eV RGasD: 1.82 Sp.Gr: 0.95 (Liquid at -6°F) Flammable Gas	VP(70°F): 5.1 atm FRZ: -18°F UEL: 32% LEL: 6.6%	Acids, water, strong oxidizers (e.g., dichlorine oxide, fluorine) [Note: Slowly hydrolyzed in water to form hydrogen cyanide, oxalic acid, or ammonia.]	None available
1026 18	1 ppm = 2.16 mg/m ³							
Cyanogen chloride CClN 506-77-4 GT2275000	Chlorocyan, Chlorine cyanide, Chlorocyanide, Chlorocyanogen	NIOSH C 0.3 ppm (0.6 mg/m ³) OSHA† none	N.D.	Colorless gas or liquid (below 55°F) with an irritating odor. [Note: Shipped as a liquefied gas. A solid below 20°F. Forms cyanide in the body.]	MW: 61.5 BP: 55°F Sol: 7% F.P.: NA IP: 12.49 eV RGasD: 2.16 Sp.Gr: 1.22 (Liquid at 32°F) Nonflammable Gas	VP: 1010 mm FRZ: 20°F UEL: NA LEL: NA	Water, acids, alkalis, ammonia, alcohols [Note: Can react very slowly with water to form hydrogen cyanide. May be stabilized to prevent polymerization.]	None available
1589 15 (inhibited)	1 ppm = 2.55 mg/m ³							
Cyclohexane C ₆ H ₁₂ 110-82-7 GU6300000	Benzene, hexahydride, Hexahydrobenzene, Hexamethylene, Hexanaphthene	NIOSH/OSHA 300 ppm (1050 mg/m ³) OSHA† none	1300 ppm [LEL]	Colorless liquid with a sweet, chloroform-like odor. [Note: A solid below 44°F.]	MW: 84.2 BP: 177°F Sol: Insoluble F.P.: 0°F IP: 9.66 eV Sp. Gr: 0.78 Class IB Flammable Liquid	VP: 78 mm FRZ: 44°F UEL: 8% LEL: 1.3%	Oxidizers	Char; CS; GCFID; B [#1500, Hydrocarbons]
1145 26	1 ppm = 3.50 mg/m ³							
Cyclohexanethiol C ₆ H ₁₁ SH 1569-89-3 GV7525000	Cyclohexylmercaptan, Cyclohexylthiol	NIOSH C 0.5 ppm (2.4 mg/m ³) (15-min) OSHA none	N.D.	Colorless liquid with a strong, offensive odor.	MW: 116.2 BP: 316°F Sol: Insoluble F.P.: 110°F IP: ? Sp.Gr: 0.98 Class II Combustible Liquid	VP: 10 mm FRZ: -181°F UEL: 7 LEL: 7	Oxidizers, reducing agents, strong acids, alkali metals	None available
3054 28	1 ppm = 4.83 mg/m ³							

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection -- maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)	
Skin: Eyes: Wash skin: Remove: Change: Provide:	Frostbite Prevent eye contact/ Frostbite N.R. When wet (flam) N.R. Frostbite	TBAL	Inh Con	Irrit eyes, nose, upper resp sys, lac, cherry red lips, tachypnea, hypoxemia, bradycardia; head, vert, convuls; dizz, loss of appetite, low-wgt; liq; frostbite	Eye: Skin: Breath:	Frostbite Frostbite Resp support	Eyes, resp sys, CNS, CVS
[Cyanogen]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact (liq) Prevent eye contact (liq) When contam (liq) When wet or contam (liq) N.R. Eyewash (liq), Quiklo drench (liq)	TBAL	Inh Abs (liq) Con (liq)	Irrit eyes, upper resp sys; cough, delayed pulm edema; weak, head, dizz, dizz, conf, nau, vomit; irreg heartbeat; irrit skin (liq)	Eye: Skin: Breath: Swallow:	Irritated Water wash immed (liq) Resp support Medical attention immed	Eyes, skin, resp sys, CNS, CVS
[Cyanogen chloride]							
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet (flam) N.R.	NIOSH/OSHA 1300 ppm: SA:CF/PAPROV/CCRFOV/ GMFOV/SCBAF/SAF § SCBAF PD PP/SAF PD PP ASCBA Escape: GMFOV/SCBAE	Inh ing Con	Irrit eyes, skin, resp sys; drow, derm, narco, coma	Eye: Skin: Breath: Swallow:	Irritated Water flush prompt Resp support Medical attention immed	Eyes, skin, resp sys, CNS
[Cyclohexane]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R. Eyewash, Quiklo drench	NIOSH 6 ppm: CCROV/SA 12.5 ppm: SA:CF/PAPROV 25 ppm: CCRFOV/GMFOV/PAPRTOV/ SCBAF/SAF § SCBAF PD PP/SAF PD PP ASCBA Escape: GMFOV/SCBAE	Inh Abs ing Con	Irrit eyes, skin, resp sys, head, dizz, weak, nau, vomit, convuls; cough, wheez, laryngitis, dysp	Eye: Skin: Breath: Swallow:	Irritated Soap flush immed Resp support Medical attention immed	Eyes, skin, resp sys, CNS

[Cyanide azide]

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P., IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Cyclohexanol $C_6H_{11}OH$ 108-93-0 GV7875000	Anol. Cyclohexyl alcohol, Hexahydrophenol, Hexatin, Hydrain Hydroxycyclohexane	NIOSH 50 ppm (200 mg/m ³) [skin] OSHA† 50 ppm (200 mg/m ³)	400 ppm	Sticky solid or colorless to light-yellow liquid (above 77°F) with a camphor-like odor	MW 100.2 BP 322°F Sol 4% Fl.P. 154°F IP 10.00 eV	VP 1 mm MLT 77°F UEL ? LEL ?	Strong oxidizers (such as hydrogen peroxide & nitric acid)	Char. 2-Propanol/ CS, GC/FID, III [#1402 Alcohols III]
1993 27 (combustible liquid, n.e.s.)	1 ppm = 4.17 mg/m ³				Sp Gr. 0.96 Class IIIA Combustible Liquid			
Cyclohexanone $C_6H_{10}O$ 108-94-1 GW1050000	Anone, Cyclohexyl ketone, Pimaleic ketone	NIOSH 25 ppm (100 mg/m ³) [skin] OSHA† 50 ppm (200 mg/m ³)	700 ppm	Water-white to pale-yellow liquid with a peppermint- or acetone-like odor.	MW 98.2 BP 312°F Sol 15% Fl.P. 146°F IP 9.14 eV	VP 5 mm FRZ -49°F UEL 9.4% LEL (212°F) 11%	Oxidizers, nitric acid	Char. CS, GC/FID, III [#1300, Ketones I]
1915 26	1 ppm = 4.06 mg/m ³				Sp Gr. 0.95 Class IIIA Combustible Liquid			
Cyclohexene C_6H_{10} 110-83-8 GW2500000	Benzene, tetrahydride, Tetrahydrobenzene	NIOSH/OSHA 300 ppm (1015 mg/m ³)	2000 ppm	Colorless liquid with a sweet odor	MW 82.2 BP 181°F Sol Insoluble Fl.P. 111°F IP 8.95 eV	VP 87 mm FRZ -154°F UEL ? LEL ?	Strong oxidizers [Note: Forms explosive peroxides with oxygen upon storage.]	Char. CS, GC/FID, III [#1500, Hydro- carbons]
2256 29	1 ppm = 3.42 mg/m ³				Sp Gr. 0.81 Class IIB Flammable Liquid			
Cyclohexylamine $C_6H_{11}NH_2$ 108-91-8 GX0700000	Aminocyclohexane, Aminohexahydrobenzene, Hexahydroaniline, Hexahydrobenzenamine	NIOSH 10 ppm (40 mg/m ³) OSHA† none	N.D.	Colorless or yellow liquid with a strong, fishy, amine-like odor.	MW: 99.2 BP: 274°F Sol: Miscible Fl.P. 88°F IP: 8.37 eV	VP: 11 mm FRZ: 0°F UEL: 9.4% LEL: 1.5%	Oxidizers, organic compounds, acid anhydrides, acid chlorides, acids, lead [Note: Corrosive to copper, aluminum, zinc & galvanized steel.]	Sigal; H ₂ SO ₄ ; GC/FID; I [#221]
2357 68	1 ppm = 4.12 mg/m ³				Sp Gr. 0.87 Class IC Flammable Liquid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 6)
Skin:	Prevent skin contact	NIOSH/OSHA				
Eyes:	Prevent eye contact	400 ppm: CCROV*/PAPROV*/GMFOV/	Inh	Irrit eyes, skin, nose,	Eye	Eyes, skin, resp sys
Wash skin:	When contam	SA*/SCBAF	Abs	throat, skin, narco	Skin	
Remove:	When wet or contam	§ SCBAF PD PP/SAF PD PP ASCBA	Ing		Breath	
Change:	Daily	Escape GMFOV/SCBAE	Con		Swallow	
[Cyclohexanol]						
Skin:	Prevent skin contact	NIOSH				
Eyes:	Prevent eye contact	625 ppm: SA CF*/PAPROV*	Inh	Irrit eyes, skin, muc memb,	Eye	Eyes, skin, resp sys,
Wash skin:	When contam	700 ppm: CCRFOV/GMFOV/PAPROV*/	Abs	head, narco, coma, derm,	Skin	CNS, liver, kidneys
Remove:	When wet or contam	SCBAF/SAF	Ing	In animals: liver, kidney	Breath	
Change:	N.R.	§ SCBAF PD PP/SAF PD PP ASCBA	Con	damage	Swallow	
		Escape GMFOV/SCBAE			Immed	
[Cyclohexanone]						
Skin:	Prevent skin contact	NIOSH/OSHA				
Eyes:	Prevent eye contact	2000 ppm: SA CF*/PAPROV*/CCRFOV/	Inh	Irrit eyes, skin, resp	Eye	Eyes, skin, resp sys,
Wash skin:	When contam	GMFOV/SCBAF/SAF	Abs	sys, drow	Skin	CNS
Remove:	When wet (flam)	§ SCBAF PD PP/SAF PD PP ASCBA	Ing		Breath	
Change:	N.R.	Escape GMFOV/SCBAE	Con		Swallow	
					Immed	
[Cyclohexene]						
Skin:	Prevent skin contact	TBAL				
Eyes:	Prevent eye contact		Inh	Irrit eyes, skin, muc	Eye	Eyes, skin, resp sys,
Wash skin:	When contam		Abs	memb, resp sys; eye, skin	Skin	CNS
Remove:	When wet (flam)		Ing	burns; skin aens; cough,	Breath	
Change:	N.R.		Con	pulm edema; drow, li-head,	Swallow	
Provide:	Eyewash, Quick drench			dizz; diarr, nau, vomit		
[Cyclohexylamine]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Cyclonite $C_2H_4N_6O_4$ 121-82-4 XY9450000	Cyclotrimethylenetri- amine; Hexahydro-1,3,5-trinitro- s-triazine; RDX; Trimethylenetriaminamine; 1,3,5-Trinitro-1,3,5- triazacyclohexane	NIOSH 1.5 mg/m ³ ST 3 mg/m ³ [skin] OSHA† none	N.D.	White, crystalline powder. [Note: A powerful high explosive.]	MW: 222.2 BP: ? Sol: Insoluble FLP: Explodes IP: ? Sp.Gr: 1.82 Combustible Solid [EXPLOSIVE]	VP(230°F): 0.0004 mm MLT: 401°F UEL: ? LEL: ?	Strong oxidizers, combustible materials, heat [Note: Detonates on contact with mercury fulminate.]	Filter; none; Grav; III [#0500, Nuisance Dust (total)]
Cyclopentadiene C_5H_6 542-92-7 GY1000000	1,3-Cyclopentadiene	NIOSH/OSHA 75 ppm [200 mg/m ³]	750 ppm	Colorless liquid with an irritating terpene-like odor	MW: 66.1 BP: 107°F Sol: Insoluble FLP(oc): 77°F IP: 0.56 eV	VP: 400 mm FRZ: -121°F UEL: ? LEL: ?	Strong oxidizers, fuming nitric acid, sulfuric acid [Note: Polymerizes to dicyclopentadiene upon standing]	Chrom-104*, Ethyl acetate, GDFID, III [#2523]
	1 ppm = 2.75 mg/m ³				Sp.Gr: 0.80 Class IC Flammable Liquid			
Cyclopentane C_5H_{10} 287-92-3 GY2390000	Pentamethylene	NIOSH 600 ppm (1720 mg/m ³) OSHA† none	N.D.	Colorless liquid with a mild, sweet odor.	MW: 70.2 BP: 121°F Sol: Insoluble FLP: -35°F IP: 10.52 eV	VP(88°F): 400 mm FRZ: -137°F UEL: 8.7% LEL: 1.1%	Strong oxidizers (e.g., chlorine, bromine, fluorine)	None available
	1 ppm = 2.92 mg/m ³				Sp.Gr: 0.75 Class IB Flammable Liquid			
Cyhexatin (C_6H_9) ₄ SnOH 13121-70-5 WH8750000	TCHH, Tricyclohexylhydroxy- stannane, Tricyclohexylhydroxystin, Tricyclohexylstannium hydroxide, Tricyclohexyltin hydroxide	NIOSH 5 mg/m ³ OSHA† 0.32 mg/m ³ [0.1 mg/m ³ (as Sn)]	80 mg/m ³ [25 mg/m ³ (as Sn)]	Colorless to white, nearly odorless, crystalline powder. [insecticide]	MW: 385.2 BP: 442°F (Decomposes) Sol: Insoluble FLP: NA IP: NA	VP: 0 mm (approx) MLT: 383°F UEL: NA LEL: NA	Strong oxidizers, ultraviolet light	Filter/ XAD-2; CH ₃ COOH/ CH ₃ CN; HPLC; AAS-GF; III [#5504, Organotin]
					Sp.Gr: ?			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)		Target organs (See Table 5)
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When wet or contam Daily Eyewash, Quick drench	TBAL	Inh Abs ing Con	Irrit eyes, skin; head, irrity, rig, weak, tremor, nau, dizz, vomit, inson, convuls	Eye: Skin: Breath: Swallow:	Irr immed Soap flush immed Resp support Medical attention immed	Eyes, skin, CNS
[Cyclonite]							
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet (flam)	NIOSH/SHA 750 ppm: CCROV/GMFOV/PAPROV/SA/ SCBAF § SCBAF-PD,PP/SAF-PD,PP-ASCBA Escape: GMFOV/SCBAE	Inh ing Con	Irrit eyes, nose	Eye: Skin: Breath: Swallow:	Irr immed Soap wash prompt Resp support Medical attention immed	Eyes, resp sys
[Cyclopentadiene]							
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact Daily When wet (flam)	TBAL	Inh ing Con	Irrit eyes, skin, nose, throat; li-head, dizz, euph, inco, nau, vomit, stupor, dry, cracking skin	Eye: Skin: Breath: Swallow:	Irr immed Soap wash Resp support Medical attention immed	Eyes, skin, resp sys, CNS
[Cyclopentane]							
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact N.R. When contam When wet or contam Daily	OSHA 3.2 mg/m ³ : CCROVDM/SA 8 mg/m ³ : SA-CF/PAPROVDM 16 mg/m ³ : CCRFOVHE/GMFOVHE/ PAPROVHE/SAT-CF/ SCBAF/SAF 80 mg/m ³ : SAF-PD,PP § SCBAF-PD,PP/SAF-PD,PP-ASCBA Escape: GMFOVHE/SCBAE	Inh Abs ing Con	Irrit eyes, skin, resp sys; head, vert; sore throat, cough; abdompain, vomit; skin burns, pruritus; in animals: liver, kidney damage	Eye: Skin: Breath: Swallow:	Irr immed Soap wash immed Resp support Medical attention immed	Eyes, skin, resp sys, liver, kidneys

[Cyclopentane]

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P., IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
2,4-D <chem>ClC6H4OCH2COOH</chem> 94-75-7 AG6825000	Dichlorophenoxyacetic acid, 2,4-Dichlorophenoxyacetic acid	NIOSH/OSHA 10 mg/m ³	100 mg/m ³	White to yellow, crystalline, odorless powder [herbicide]	MW: 221.0 BP: Decomposes Sol: 0.05% Fl.P. NA IP: ?	VP(320°F): 0.4 mm MLT: 280°F UEL: NA LEL: NA	Strong oxidizers	Filter; Methanol, HPLC/UV, III [#5001]
2765 55					Sp Gr: 1.57 Noncombustible Solid, but may be dissolved in flammable liquids			
DOT <chem>(C6H4Cl)2CHCCl3</chem> KJ3325000	p,p'-DDT; Dichlorodiphenyltrichloro- ethane 1,1,1-Trichloro-2,2- bis(p-chlorophenyl)ethane	NIOSH Ca See Appendix A 0.5 mg/m ³ OSHA 1 mg/m ³ [skin]	Ca [500 mg/m ³]	Colorless crystals or off-white powder with a slight, aromatic odor [pesticide]	MW: 354.5 BP: 230°F (Decomposes) Sol: Insoluble Fl.P. 162-171°F IP: ?	VP: 0.0000002 mm MLT: 227°F UEL: ? LEL: ?	Strong oxidizers, alkalis	Filter; Isocetane, GC/ECD, III(3) [#S274]
2761 55					Sp Gr: 0.99 Combustible Solid			
Decaborane <chem>B10H12</chem> 17702-41-9 HD1400000	Decaboron, tetradecahydride	NIOSH 0.3 mg/m ³ (0.05 ppm) ST 0.9 mg/m ³ (0.15 ppm) [skin] OSHA† 0.3 mg/m ³ (0.05 ppm) [skin]	16 mg/m ³	Colorless to white crystalline solid with an intense, bitter, chocolate- like odor	MW: 122.2 BP: 415°F Sol: Slight Fl.P. 176°F IP: 9.88 eV	VP: 0.2 mm MLT: 211°F UEL: ? LEL: ?	Oxidizers, water, halogenated com- pounds (especially carbon tetrachloride) [Note: May ignite SPONTANEOUSLY on exposure to air Decomposes slowly in hot water.]	None available
1868 34	1 ppm = 5.06 mg/m ³				Sp Gr: 0.94 Combustible Solid			
1-Decanethiol <chem>CH3(CH2)9SH</chem> 143-10-2	Decylmercaptan, n-Decylmercaptan, 1-mercaptodecane	NIOSH C 0.8 ppm (3.8 mg/m ³) [15-min] OSHA none	N.D.	Colorless liquid with a strong odor.	MW: 174.4 BP: 485°F Sol: Insoluble Fl.P: 209°F IP: ?	VP: ? FRZ: -16°F UEL: ? LEL: ?	Oxidizers, strong acids & bases, alkali metals, nitric acid	None available
	1 ppm = 7.25 mg/m ³				Sp.Gr: 0.84 Class IIIB Combustible Liquid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 6)	First aid (See Table 8)	Target organs (See Table 6)
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Weak, stupor,	Eye:	Skin, CNS, liver,
Eye:	Prevent eye contact	100 mg/m ³ : CCRVDMFu/GMFOVHIE/	Abs	hyporeflexia, muscle twitch;	Skin:	kidneys
Wash skin:	When contam	PAPROVDMFu/SA/SCBAF	Ing	convuls, derm,	Breath:	
Remove:	When wet or contam	5 SCBAF PD PP/SAF PD PP ASCBA	Con	in animals: liver, kidney inj	Swallow:	
Change:	Daily	Escape: GMFOVHIE/SCBAE				
[2,4-D]						
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, skin, pares,	Eye:	Eyes, skin, CNS,
Eye:	Prevent eye contact	5 SCBAF PD PP/SAF PD PP ASCBA	Abs	tongue, lips, face, tremor,	Skin:	kidneys, liver, PNS
Wash skin:	When contam/Daily	Escape: GMFOVHIE/SCBAE	Ing	appt, dizz, conf, mal,	Breath:	[in animals:
Remove:	When wet or contam		Con	head, rig, convuls, paresis	Swallow:	liver, lung &
Change:	Daily			hands, vomit, [carc]		lymphatic tumors]
Provide:	Eyewash, Quick drench					
[DDT]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Dizz, head, nau, k-head,	Eye:	CNS, liver, kidneys
Eye:	Prevent eye contact	3 mg/m ³ : SA	Abs	drow, inco, local musc,	Skin:	
Wash skin:	When contam/Daily	7.5 mg/m ³ : SA CF	Ing	spasm, tremor, convuls,	Breath:	
Remove:	When wet or contam	15 mg/m ³ : SAT CF/SCBAF/SAF	Con	rig,	Swallow:	
Change:	Daily	5 SCBAF PD PP/SAF PD PP ASCBA		in animals: dyp: weak,		
Provide:	Eyewash, Quick drench	Escape: GMFOVHIE/SCBAE		liver, kidney damage		
[Decaborane]						
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, skin, resp	Eye:	Eyes, skin, resp sys,
Eye:	Prevent eye contact	5 ppm: CCRV/SA	Abs	sys; conf, dizz, head,	Skin:	CNS
Wash skin:	When contam	12.5 ppm: SA CF/PAPROV	Ing	drow, nau, vomit, weak,	Breath:	
Remove:	When wet or contam	25 ppm: CCRFOV/GMFOV/PAPRTOV/	Con	convuls	Swallow:	
Change:	N.R.	SCBAF/SAF				
		5 SCBAF PD PP/SAF PD PP ASCBA				
		Escape: GMFOV/SCBAE				
[1-Decanethiol]						

Chemical name, structure formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P., IP, Sp. Gr., flammability	VP, FRZ UEL, LEL		
Demeton $(C_6H_5O)_2PSOC_2H_5SC_2H_5$ 8065-48-3 TF3150000	O,O-Diethyl-O-(and S)-2- (ethylthio)ethyl phosphorothioate mixture; Systox®	NIOSH/OSHA 0.1 mg/m ³ [skin]	10 mg/m ³	Amber, oily liquid with a sulfur-like odor [insecticide]	MW: 258.3 BP: Decomposes Sol: 0.01% Fl.P: 113°F IP: ?	VP: 0.0003 mm FRZ: <13°F UEL: ? LEL: ?	Strong oxidizers, alkalis, water	Filter/ XAD-2; Toluene GC/FPD, III [#5514]
	1 ppm = 10.74 mg/m ³				So Gr: 1.12 Class II Combustible Liquid			
Acetone alcohol $CH_3COCH_2C(CH_3)_2OH$ 123-42-2 SA9100000	Diacetone, 4-Hydroxy-4-methyl-2- pentanone, 2-Methyl-2-pentanol-4-one	NIOSH/OSHA 50 ppm (240 mg/m ³)	1800 ppm [LEL]	Colorless liquid with a faint minty odor.	MW: 116.2 BP: 334°F Sol: Miscible Fl.P: 125°F IP: ?	VP: 1 mm FRZ: -47°F UEL: 6.9% LEL: 1.8%	Strong oxidizers, strong alkalis	Char. 2-Propanol/ CS, GC/FID, III [#1402 Alcohols III]
1148-26	1 ppm = 4.83 mg/m ³				Sp Gr: 0.94 Class II Combustible Liquid			
2,4-Diaminoanisole (and its salts) $(NH_2)_2C_6H_4OCH_3$ 615-05-4 BZ8580500	1,3-Diamino-4-methoxy- benzene; 4-Methoxy-1,3-benzene- diamine; 4-Methoxy-m-phenylene- diamine Synonyms of salts vary depending upon the specific compound.	NIOSH Ca Minimize occupational exposure (especially skin exposures) See Appendix A OSHA none	Ca [N.D.]	Colorless solid (needles). [Note: The primary use (including its salts such as 2,4-diaminoanisole sulfate) is a component of hair & fur dye formu- lations.]	MW: 138.2 BP: ? Sol: ? Fl.P: ? IP: ? Sp.Gr: ? Combustible Solid	VP: ? MLT: 163°F UEL: ? LEL: ?	Strong oxidizers	None available
o-Dianisidine $(NH_2C_6H_4)_2$ 119-90-4 DD0875000	Dianisidine; 3,3'-Dianisidine; 3,3'-Dimethoxybenzidine	NIOSH Ca See Appendix A See Appendix C OSHA See Appendix C	Ca [N.D.]	Colorless crystals that turn a violet color on standing. [Note: Used as a basis for many dyes.]	MW: 244.3 BP: ? Sol: Insoluble Fl.P: 403°F IP: ? Sp.Gr: ? Combustible Solid	VP: ? MLT: 279°F UEL: ? LEL: ?	Oxidizers	Filter; water; HPLC/GUVD; # [#5013, Dyes]

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin, miosis,	Eye	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	1 mg/m ³ SA	Abs	ache eyes, rhin, head,	Skin	CVS, CNS, blood chol
Wash skin:	When contam	2.5 mg/m ³ SA CF	Inh	chest tight, wheez, lar	Breath	Resp support
Remove:	When wet or contam	5 mg/m ³ SAT CF/SCBAF/SAF	Con	spasm, saliv, cyan, anor,	Swallow	Medical attention
Change:	Daily	10 mg/m ³ SA/PD/PP		naus, vomit, abdom cramps,		Immed
Provide:	Eyewash, Quick drench	5 SCBAF PD PP/SAF PD PP ASCBA		diarr, local sweat, musc,		
		Escape: GMFOVHIE/SCBAE		fasc, weak para, gidd, conf,		
				ataxia, convuls, coma, low		
				BP, card irreg		
[Demeton]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin, nose	Eye	Eyes, skin, resp
Eyes:	Prevent eye contact	1250 ppm: SA, CF/PAPROV*	Inh	throat, corn damage,	Skin	sys, CNS, liver
Wash skin:	When contam	1800 ppm: CCRFOV/GMFOV/PAPRTOV/Con	Con	in animals: narco,	Breath	
Remove:	When wet or contam	5 SCBAF PD PP/SAF PD PP ASCBA		liver damage	Swallow	
Change:	N.R.	Escape: GMFOV/SCBAE				
[Diacetone alcohol]						
Skin:	Prevent skin contact	NIOSH	Inh	In animals: irrit skin;	Eye:	Skin, thyroid, liver,
Eyes:	Prevent eye contact	# SCBAF PD, PP/SAF PD, PP: ASCBA	Abs	thyroid, liver changes;	Skin:	repro sys
Wash skin:	When contam/Daily	Escape: GMFOVHIE/SCBAE	Inh	terato effects; [canc]	Breath:	[In animals:
Remove:	When wet or contam		Con		Swallow:	thyroid, liver,
Change:	Daily					skin & lymphatic
Provide:	Eyewash, Quick drench					sys tumors]
[2,4-Diaminoanisole (and its salts)]						
Skin:	Prevent skin contact	NIOSH	Inh	Irrit skin;	Eye:	Skin, kidneys, liver,
Eyes:	Prevent eye contact	# SCBAF PD, PP/SAF PD, PP: ASCBA	Abs	in animals: kidney, liver	Skin:	thyroid, spleen
Wash skin:	When contam/Daily	Escape: GMFOVHIE/SCBAE	Inh	damage; thyroid, spleen	Breath:	[In animals:
Remove:	When wet or contam		Con	changes; [canc]	Swallow:	bladder, liver,
Change:	Daily					stomach & mammary
Provide:	Eyewash, Quick drench					gland tumors]
[o-Diethylsiline]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL F.P., IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Diazinon® C ₁₂ H ₁₁ N ₃ O ₃ PS 333-41-5 TF3325000	Basudin®; Diazide®; O,O-Diethyl-O-2-isopropyl- 4-methyl-6-pyrimidinyl- phosphorothioate; Spectracide®	NIOSH 0.1 mg/m³ [skin] OSHA† none	N.D.	Colorless liquid with a faint ester-like odor. [Insecticide] [Note: Technical grade is pale to dark brown.]	MW: 304.4 BP: Decomposes Sol: 0.004% F.P: 180°F IP: ?	VP: 0.0001 mm FRZ: ? UEL: ? LEL: ?	Strong acids & alkalis, copper-containing compounds [Note: Hydrolyzes slowly in water & dilute acid.]	None available
2783 55	1 ppm = 12.65 mg/m³				Sp.Gr: 1.12 Class IIIA Combustible Liquid			
Diazomethane CH ₂ N ₂ 334-88-3 PA7000000	Azomethylene, Azomethylene, Diazirine	NIOSH/OSHA 0.2 ppm (0.4 mg/m³)	2 ppm	Yellow gas with a musty odor [Note: Shipped as a liquefied compressed gas]	MW 42.1 BP: -9°F Sol: Reacts F.P: NA (Gas) IP: 9.00 eV	VP >1 atm FRZ: -229°F UEL: ? LEL: ?	Alkali metals, water, drying agents such as calcium arsenate [Note: May explode violently on heating, exposure to sunlight, or contact with rough edges such as ground glass.]	XAD-2*, CS, GCFID, II [#2515]
	1 ppm = 1.75 mg/m³				RGasD: 1.45 Flammable Gas [EXPLOSIVE!]			
Diborane B ₂ H ₆ 19287-45-7 HQ9275000	Borothane, Boron hydride, Diboron hexahydride	NIOSH/OSHA 0.1 ppm (0.1 mg/m³)	15 ppm	Colorless gas with a repulsive, sweet odor. [Note: Usually shipped in pressurized cylinders diluted with hydrogen, argon, nitrogen, or helium.]	MW: 27.7 BP: -135°F Sol: Reacts F.P: NA (Gas) IP: 11.36 eV	VP(82°F): 39.5 atm FRZ: -265°F UEL: 88% LEL: 0.8%	Water, halogenated compounds, aluminum, lithium, oxidized surfaces, acids [Note: Will ignite spontaneously in moist air at room temperature. Reacts with water to form hydrogen & boric acid.]	Filter/ Char*, H ₂ O, PES, III [#6006]
1911 18	1 ppm = 1.15 mg/m³				RGasD: 0.97 Flammable Gas			
1,2-Dibromo-3-chloro- propane CH ₂ BrCHBrCH ₂ Cl 96-12-8 TX8750000	1-Chloro-2,3-dibromo- propane; DBCP; Dibromochloropropane	NIOSH Ca See Appendix A OSHA[1910.1044] 0.001 ppm	Ca [N.D.]	Dense yellow or amber liquid with a pungent odor at high concentra- tions. [pesticide] [Note: A solid below 43°F.]	MW: 236.4 BP: 384°F Sol: 0.1% F.P(oc): 170°F IP: ?	VP: 0.8 mm FRZ: 43°F UEL: ? LEL: ?	Chemically-active metals such as aluminum, magnesium & tin alloys [Note: Corrosive to metals.]	None available
2872 58	1 ppm = 9.83 mg/m³				Sp. Gr: 2.05 Class IIIA Combustible Liquid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	Prevent skin contact	TBAL	Inh	Irrit eyes; miosis, blurred vision; dizz, conf, weak, convuls; dysp; saliv, abdom cramps, nau, vomit	Eye: Irr Skin: Irr Breath: Soap wash Swallow: immed Resp support Medical attention immed	Eyes, resp sys, CNS, CVS, blood chol
Eyes:	Prevent eye contact		Abs			
Wash skin:	When contam		ing			
Remove:	When wet or contam		Con			
Change:	Daily					
Provide:	Eyewash, Quick drench					
[Diazinon]						
Skin:	Frostbite	NIOSH/OSHA	Inh	Irrit eyes; cough, short breath; head, fig, flush	Eye: Frostbite Skin: Frostbite Breath: Resp support	Eyes, resp sys
Eyes:	Frostbite	2 ppm: SA*/SCBAF	Con (liq)	skin, fever, chest pain, pulm edema, pneumis, asthma, liq: frostbite		
Wash skin:	N.R.	6 SCBAF PD PP/SAF PD PP ASCBA				
Remove:	When wet (flam)	Escape: GMFOV/SCBAE				
Change:	N.R.					
Provide:	Frostbite					
[Diazomethane]						
Skin:	N.R.	NIOSH/OSHA	Inh	Chest tight, precordial pain, short breath, non-productive cough, nau, head, li-head, vert, chills, fever, fig, weak, tremor, musc fasc, in animals: liver, kidney damage, pulm edema, hemorrh	Breath: Resp support	Resp sys, CNS, liver, kidneys
Eyes:	N.R.	1 ppm: SA				
Wash skin:	N.R.	2.5 ppm: SA, CF				
Remove:	N.R.	5 ppm: SAT CF/SCBAF/SAF				
Change:	N.R.	15 ppm: SA, PD, PP				
		6 SCBAF PD PP/SAF PD PP ASCBA				
		Escape: GMFS/SCBAE				
[Diborane]						
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, skin, nose, throat, drow, nau, vomit, pulm edema, liver, kidney inj; sterility; [carc]	Eye: Irr Skin: Irr Breath: Soap wash Swallow: immed Resp support Medical attention immed	Eyes, skin, resp sys, CNS, liver, kidneys, spleen, repro sys, digestive sys [in animals: cancer of the nasal cavity, tongue, pharynx, lungs, stomach, adrenal & mammary glands]
Eyes:	Prevent eye contact	* SCBAF PD PP/SAF PD PP ASCBA	Abs			
Wash skin:	When contam/Daily	Escape: GMFOVHE/SCBAE	ing			
Remove:	When wet or contam		Con			
Change:	Daily					
Provide:	Eyewash, Quick drench					
[1,2-Dibromo-3-chloropropane]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOTID and guide No.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL F.P., IP, Sp, Gr, Flammability	VP, FRZ UEL, LEL		
2-N-Dibutylaminoethanol (C ₈ H ₁₉) ₂ NCH ₂ CH ₂ OH 102-81-8 KX3850000	Dibutylaminoethanol; 2-Dibutylaminoethanol; 2-Di-N-butylaminoethanol; 2-Di-N-butylaminoethyl alcohol; N,N-Dibutylethanamine	NIOSH 2 ppm (14 mg/m ³) [skin] OSHA† none	N.D.	Colorless liquid with a faint, amine-like odor.	MW: 173.3 BP: 446°F Sol: 0.4% F.P.: 195°F IP: ?	VP: 0.1 mm FRZ: ? UEL: ? LEL: ?	Oxidizers	Sigal; Methanol/ water; GC/FID; II [#2007, Amino- ethanol Compounds]
2873 66	1 ppm = 7.20 mg/m ³				Sp.Gr: 0.88 Class IIA Combustible Liquid			
Dibutyl phosphate (C ₈ H ₁₉ O ₂) ₂ (OH)PO 107-66-4 TB9605000	Dibutyl acid o-phosphate, di-n-Butyl hydrogen phosphate, Dibutyl phosphoric acid	NIOSH 1 ppm (5 mg/m ³) ST 2 ppm (10 mg/m ³) OSHA† 1 ppm (5 mg/m ³)	30 ppm	Pale amber, odorless liquid	MW 210.2 BP 212°F (Decomposes) Sol insoluble F.P. ? IP: ?	VP 1 mm (approx) FRZ ? UEL ? LEL ?	Strong oxidizers	Filter, CH,CN, GC/FPD, III [#5017]
	1 ppm = 8.74 mg/m ³				Sp Gr 1.06 Combustible Liquid			
Dibutylphthalate C ₈ H ₁₇ (COOC ₂ H ₅) ₂ 84-74-2 TI0875000	DBP, Dibutyl 1,2-benzene- dicarboxylate, Di-n-butyl phthalate	NIOSH/OSHA 5 mg/m ³	4000 mg/m ³	Colorless to faint yellow, oily liquid with a slight, aromatic odor.	MW 278.3 BP 274°F Sol(77°F) 0.001% F.P: 315°F IP: ?	VP: 0.00007 mm FRZ -31°F UEL ? LEL(458°F): 0.9%	Nitrates, strong oxidizers, alkalis & acids, liquid chlorine	Filter, CS, GC/FID; III [#5020]
	1 ppm = 11.57 mg/m ³				Sp Gr: 1.05 Class IIIB Combustible Liquid			
Dichloroacetylene ClC≡CCl 7573-29-4 AP1080000	DCA, Dichloroethyne [Note: DCA is a possible decomposition product of trichloroethylene or trichloroethane.]	NIOSH Ca See Appendix A C 0.1 ppm (0.4 mg/m ³) OSHA† none	Ca [N.D.]	Volatile oil with a disagreeable, sweetish odor. [Note: A gas above 80°F. DCA is not produced commercially.]	MW: 94.8 BP: 90°F (Explodes) Sol: ? F.P.: ? IP: ?	VP: ? FRZ: -58 to -87°F UEL: ? LEL: ?	Oxidizers, heat, shock	None available
	1 ppm = 3.95 mg/m ³				Sp.Gr: 1.26 Combustible Liquid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 6)
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R. Eyewash, Quick drench	TBAL	Inh Abs Inj Con	In animals: Irrit eyes, skin, nose, derm; skin, corn nec; low-wgt	Eye: Skin: Breath: Swallow: Irr Irrmed Soap flush Irrmed Resp support Medical attention Irrmed	Eyes, skin, resp sys
[2-N-Dibutylaminoethanol]						
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R. Quick drench	NIOSH/OSHA 10 ppm: SA 25 ppm: SA, CF 30 ppm: SAT-CF/SCBAF/SAF § SCBAF PD, PP/SAF PD, PP ASCBA Escape: GMFOVH/SCBAE	Inh Inj Con	Irrit eyes, skin, resp sys; head	Eye: Skin: Breath: Swallow: Irr Irrmed Soap wash prompt Resp support Medical attention Irrmed	Eyes, skin, resp sys
[Dibutyl phosphate]						
Skin: Eyes: Wash skin: Remove: Change:	N.R. Prevent eye contact N.R. N.R. N.R.	NIOSH/OSHA 50 mg/m ³ DMF 125 mg/m ³ SA, CF ¹ /PAPRDM ¹ 250 mg/m ³ HIEF/SCBAF/SAF 4000 mg/m ³ : SAF, PD, PP § SCBAF PD, PP/SAF PD, PP ASCBA Escape: HIEF/SCBAE	Inh Inj Con	Irrit eyes, upper resp sys, stomach	Eye: Skin: Breath: Swallow: Irr Irrmed Wash regularly Resp support Medical attention Irrmed	Eyes, resp sys, GI tract
[Dibutyl phthalate]						
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet (flamem) N.R. Eyewash, Quick drench	NIOSH § SCBAF PD, PP/SAF PD, PP ASCBA Escape: GMFOV/SCBAE	Inh Abs Inj Con	Head, loss of appetite, nau, vomit, intense jaw pain; cranial nerve palsy; In animals: kidney, liver, brain inj; low-wgt; [canc]	Eye: Skin: Breath: Swallow: Irr Irrmed Soap flush Irrmed Resp support Medical attention Irrmed	CNS [In animals: kidney tumors]
[Dichloroacetylene]						

Chemical name, structural formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
o-Dichlorobenzene $C_6H_4Cl_2$ 95-50-1 C24500000	o-DCB, 1,2-Dichlorobenzene, ortho-Dichlorobenzene; o-Dichlorobenzol	NIOSH/OSHA C 50 ppm (300 mg/m ³)	200 ppm	Colorless to pale- yellow liquid with a pleasant aromatic odor. [herbicide]	MW 147.0 BP 357°F Sol 0.01% Fl.P 151°F IP 9.06 eV	VP 1 mm FRZ 11°F UEL 9.2% LEL 2.2%	Strong oxidizers, aluminum, chlorides, acids, acid fumes	Char, CS, GC/FID; III [#1003, Haloge- nated Hydro- carbons]
1591 58	1 ppm = 6.11 mg/m ³				Sp Gr 1.30 Class IIIA Combustible Liquid			
p-Dichlorobenzene $C_6H_4Cl_2$ 106-46-7 C24550000	p-DCB, 1,4-Dichlorobenzene, para-Dichlorobenzene, Dichlorobenzene	NIOSH Ca See Appendix A OSHA† 75 ppm (460 mg/m ³)	Ca [150 ppm]	Colorless or white crystalline solid with a mothball- like odor [insecticide]	MW 147.0 BP 345°F Sol 0.008% Fl.P 150°F IP 8.98 eV	VP 1.3 mm MLT 126°F UEL ? LEL 2.0%	Strong oxidizers (such as chlorine or permanganate)	Char, CS, GC/FID; III [#1003, Haloge- nated Hydro- carbons]
1592 58	1 ppm = 6.11 mg/m ³				Sp Gr 1.25 Combustible Solid, but may take some effort to ignite.			
3,3'-Dichlorobenzidine (and its salts) $NH_2C_6H_3Cl_2C_6H_3Cl_2NH_2$ 91-94-1 DD0525000	4,4'-Diamino-3,3'-dichloro- biphenyl, Dichlorobenzidine base, o-o'-Dichlorobenzidine, 3,3'-Dichlorobiphenyl-4,4'- diamine, 3,3'-Dichloro-4,4'-biphenyl- diamine, 3,3'-Dichloro-4,4'-diamino- biphenyl	NIOSH Ca See Appendix A OSHA [1910.1007] See Appendix B	Ca [N.D.]	Gray to purple, crystalline solid.	MW 253.1 BP 788°F Sol (68°F): 0.07% Fl.P ? IP ?	VP ? MLT 271°F UEL ? LEL ?	None reported	Filter/ Si gel, Reagent, HPLC/UV, III [#5509]
Dichlorodifluoromethane CCl_2F_2 75-71-8 PA8200000	Difluorodichloromethane, Fluorocarbon 12, Freon® 12, Genetron® 12, Halon® 122, Propellant 12, Refrigerant 12	NIOSH/OSHA 1000 ppm (4950 mg/m ³)	15,000 ppm	Colorless gas with an ether-like odor at extremely high concentrations. [Note: Shipped as a liquefied compressed gas.]	MW 120.9 BP -22°F Sol (77°F) 0.03% Fl.P NA IP 11.75 eV	VP 5.7 atm FRZ -252°F UEL NA LEL NA	Chemically-active metals such as sodium, potassium, calcium, powdered aluminum, zinc & magnesium	Char(2), CH, Cl, GC/FID; III [#1018]
1028 12	1 ppm = 5.03 mg/m ³				RGasD: 4.2 Nonflammable Gas			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 6)	
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R.	NIOSH/OSHA 200 ppm: CCRFOV/PAPROV/SCBAF/SAF § SCBAF PD PP/SAF PD PP ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, nose, liver, kidney damage, skin blisters	Eye Skin Breath Swallow	Irrigated Soap wash prompt Resp. support Medical attention immed	Eyes, skin, resp sys, liver, kidneys
[o-Dichlorobenzene]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam/Daily When wet or contam Daily Eyewash, Quick drench	NIOSH § SCBAF PD PP/SAF PD PP ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Eye/mt, swell, periorb; profuse rhinitis, head, anor, nau, vomit, low-wgt, jaund, crr, in animals: liver, kidney inf. [canc]	Eye Skin Breath: Swallow	Irrigated Soap wash Resp. support Medical attention immed	Liver, resp sys, eyes, kidneys, skin [in animals: liver & kidney cancer]
[p-Dichlorobenzene]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam/Daily When wet or contam Daily Eyewash, Quick drench	NIOSH § SCBAF PD PP/SAF PD PP ASCBA Escape: HIEF/SCBAE	Inh Abs Ing Con	Skin sens, derm, head, dizz; caustic burns; frequent urination, dysuria; hema; GI upset, upper resp infection, [canc]	Eye Skin Breath: Swallow	Irrigated Soap wash immed Resp. support Medical attention immed	Bladder, liver, lung, skin, GI tract [in animals: liver & bladder cancer]
[3,3'-Dichlorobenzidine (and its salts)]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Frostbite Frostbite N.R. N.R. N.R. Frostbite	NIOSH/OSHA 10,000 ppm: SA 15,000 ppm: SA-CF/SCBAF/SAF § SCBAF PD PP/SAF PD PP ASCBA Escape: GMFOV/SCBAE	Inh Con [§]	Dizz, tremor, asphy, uncon, card arrhy, card arrest, lig: frostbite	Eye: Skin: Breath:	Frostbite Frostbite Resp support	CVS, PNS
[Dichlorodifluoromethane]							

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL F.P., IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
1,3-Dichloro-5,5- dimethylhydantoin $C_5H_8Cl_2N_2O_2$ 118-52-5 MU0700000	Dactin, DOH, Halane	NIOSH 0.2 mg/m ³ ST 0.4 mg/m ³ OSHA† 0.2 mg/m ³	5 mg/m ³	White powder with a chlorine-like odor.	MW 197.0 BP: ? Sol: 0.2% F.P. 346°F IP: ?	VP: ? MLT 270°F UEL: ? LEL: ?	Water, strong acids, easily oxidized materials such as ammonia salts & sulfides	None available
					Sp Gr 1.5 Combustible Solid			
1,1-Dichloroethane $CH_3CH_2Cl_2$ 75-34-3 K0175000	Asymmetrical dichloroethane, Ethylidene chloride, 1,1-Ethylidene dichloride	NIOSH 100 ppm (400 mg/m ³) See Appendix C (Chloroethanes) OSHA 100 ppm (400 mg/m ³)	3000 ppm	Colorless, oily liquid with a chloroform-like odor.	MW 99.0 BP: 135°F Sol: 0.6% F.P. 2°F IP: 11.06 eV	VP: 182 mm FRZ: -143°F UEL 11.4% LEL 5.4%	Strong oxidizers, strong caustics	Char, CS, GC/FID, II [#1003, Halo- genated Hydro- carbons]
2362 27	1 ppm = 4.12 mg/m ³				Sp Gr 1.18 Class IB Flammable Liquid			
1,2-Dichloroethylene $C_2H_2Cl_2$ 540-59-0 KV9360000	Acetylene dichloride, cis-Acetylene dichloride, trans-Acetylene dichloride, sym-Dichloroethylene	NIOSH/OSHA 200 ppm (790 mg/m ³)	1000 ppm	Colorless liquid (usually a mixture of the cis & trans isomers) with a slightly acid, chloroform-like odor	MW 97.0 BP 115-140°F Sol: 0.4% F.P. 36-39°F IP: 9.65 eV	VP: 180-265 mm FRZ: -57 to -115°F UEL 12.8% LEL 5.6%	Strong oxidizers, strong alkalis, potassium hydroxide, copper [Note: Usually contains inhibitors to prevent polymeri- zation.]	Char, CS, GC/FID, II [#1003, Halo- genated Hydro- carbons]
1150 29	1 ppm = 4.03 mg/m ³				Sp Gr (77°F) 1.27 Class IB Flammable Liquid			
Dichloroethyl ether $(C_2H_5CH_2)_2O$ 111-44-4 KN0875000	bis(2-Chloroethyl)ether, 2,2'-Dichloroethyl ether, 2,2'-Dichloroethyl ether	NIOSH Ca See Appendix A 5 ppm (30 mg/m ³) ST 10 ppm (60 mg/m ³) [skin] OSHA† C 15 ppm (90 mg/m ³) [skin]	Ca [100 ppm]	Colorless liquid with a chlorinated solvent-like odor.	MW 143.0 BP 352°F Sol 1% F.P. 131°F IP: ?	VP 0.7 mm FRZ -58°F UEL ? LEL 2.7%	Strong oxidizers [Note: Decomposes in presence of moisture to form hydrochloric acid.]	Char, CS, GC/FID, II [#1004]
1916 55	1 ppm = 5.94 mg/m ³				Sp Gr 1.22 Class II Combustible Liquid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 6)
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, muc memb,	Eye	Eyes, resp sys
Eyes:	Prevent eye contact	2 mg/m ³ SA	Ing	resp sys	Skin	
Wash skin:	When contam	5 mg/m ³ SA CF/SCBAF/SAF	Con		Breath	
Remove:	When wet or contam	§ SCBAF PD PP/SAF PD PP ASCBA			Swallow	
Change:	Daily	Escape: GMFSHE/SCBAE				
Provide:	Eyewash					
[1,3-Dichloro-5,5-dimethylhydantoin]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit skin, CNS depres,	Eye	Skin, liver,
Eyes:	Prevent eye contact	1000 ppm SA	Ing	liver, kidney, lung	Skin	kidneys, lungs,
Wash skin:	When contam	2500 ppm SA CF	Con	damage	Breath	CNS
Remove:	When wet (flam)	3000 ppm: SCBAF/SAF			Swallow	
Change:	N.R.	§ SCBAF PD PP/SAF PD PP ASCBA				
		Escape: GMFOV/SCBAE				
[1,1-Dichloroethane]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, resp sys, CNS	Eye	Eyes, resp sys, CNS
Eyes:	Prevent eye contact	1000 ppm: SA: CF/PAPROV/CCRFOW/	Ing	depres	Skin	
Wash skin:	When contam	GMFOV/SCBAF/SAF	Con		Breath	
Remove:	When wet (flam)	§ SCBAF PD PP/SAF PD PP ASCBA			Swallow	
Change:	N.R.	Escape: GMFOV/SCBAE				
[1,2-Dichloroethylene]						
Skin:	Prevent skin contact	NIOSH	Inh	Irrit nose, throat, resp	Eye	Eyes, resp sys,
Eyes:	Prevent eye contact	§ SCBAF PD PP/SAF PD PP ASCBA	Abs	sys, lac, cough, nau, vomit,	Skin	liver
Wash skin:	When contam	Escape: GMFOV/SCBAE	Ing	in animals pulm edema,	Breath	[in animals:
Remove:	When wet or contam		Con	liver damage, [carc]	Swallow	liver tumors]
Change:	N.R.					
Provide:	Eyewash, Quick drench					
[Dichloroethyl ether]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Dichloromonofluoro- methane <chem>CHCl2F</chem> 75-43-4 PAB400000	Dichlorofluoromethane, Fluorodichloromethane, Freon® 21, Genetron® 21, Halon® 112, Refrigerant 21	NIOSH 10 ppm (40 mg/m³) OSHA† 1000 ppm (4200 mg/m³)	5000 ppm	Colorless gas with a slight, ether- like odor [Note: A liquid below 48°F. Shipped as a liquefied compressed gas.]	MW: 102.9 BP: 48°F Sol: (86°F) 0.7% FLP: NA IP: 12.39 eV	VP (70°F): 1.6 atm FRZ: -211°F UEL: NA LEL: NA	Chemically-active metals such as sodium, potassium, calcium, powdered aluminum, zinc & magnesium, acid, acid fumes	Char(2); CS; GCFID; III [#2516]
1029 12	1 ppm = 4.28 mg/m³				RGasD: 3.57 Nonflammable Gas			
1,1-Dichloro-1-nitro- ethane <chem>CH3CCl2NO2</chem> 584-72-9 K11050000	Dichloronitroethane	NIOSH/OSHA 2 ppm (10 mg/m³) OSHA† C 15 ppm (60 mg/m³)	25 ppm	Colorless liquid with an unpleasant odor. [Fumigant]	MW: 143.9 BP: 255°F Sol: 0.3% FLP: 136°F IP: ?	VP: 15 mm FRZ: ? UEL: ? LEL: ?	Strong oxidizers [Note: Corrosive to iron in presence of moisture.]	Char(pet); CS; GCFID; III [#1601]
2650 57	1 ppm = 5.98 mg/m³				Sp. Gr: 1.43 Class II Combustible Liquid			
1,3-Dichloropropene <chem>ClCH=CHCH2Cl</chem> 542-75-6 UC8310000	3-Chloroallyl chloride; DCP; 1,3-Dichloro-1-propene; 1,3-Dichloropropylene; Telone®	NIOSH Ca 1 ppm (5 mg/m³) [skin] See Appendix A OSHA† none	Ca [N.D.]	Colorless to straw- colored liquid with a sharp, sweet, irritating, chloroform-like odor. [Insecticide] [Note: Exists as mixture of cis- & trans-isomers.]	MW: 111.0 BP: 228°F Sol: 0.2% FLP: 77°F IP: 7	VP: 28 mm FRZ: -119°F UEL: 14.5% LEL: 5.3%	Aluminum, magnesium, halogens, oxidizers [Note: Epichlorohydrin may be added as a stabilizer.]	None available
2047 29	1 ppm = 4.61 mg/m³				Sp. Gr: 1.21 Class IC Flammable Liquid			
2,2-Dichloropropionic acid <chem>CH3CCl2COOH</chem> 75-99-0 UF0890000	Dalapon; 2,2-Dichloropropanoic acid; α,α-Dichloropropionic acid	NIOSH 1 ppm (6 mg/m³) OSHA† none	N.D.	Colorless liquid with an acid odor. [herbicide] [Note: A white to tan powder below 46°F. The sodium salt, a white powder, is often used.]	MW: 143.0 BP: 274°F Sol: 50% FLP: NA IP: ?	VP: ? FRZ: 46°F UEL: NA LEL: NA	Metals [Note: Very corrosive to aluminum & copper alloys. Reacts slowly in water to form hydrochloric & pyruvic acids.]	None available
1760 80	1 ppm = 5.94 mg/m³				Sp. Gr: 1.40 Noncombustible Liquid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 5)	Target organs (See Table 5)	
Skin: Eyes: Wash skin: Remove: Change: Provide:	Frostbite Frostbite N.R. N.R. N.R. Frostbite	NIOSH/OSHA 100 ppm: SA 250 ppm: SA/CF 500 ppm: SCBAF/SAF 5000 ppm: SA/PD, PP § SCBAF-PD, PP/SAF-PD, PP ASCBA Escape: GMFOV/SCBAE	Inh Con (liq)	Asphy, card arrhy, card arrest, liq. frostbite	Eye: Stun: Breath	Frostbite Frostbite Resp support	Resp sys, CVS
[Dichloromono-fluoromethane]							
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R.	NIOSH/OSHA 20 ppm: SA 25 ppm: SA/CF/SCBAF/SAF § SCBAF-PD, PP/SAF-PD, PP ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	In animals: irrit eyes, skin, liver, heart, kidney damage; pulm edema, hemorr	Eye Skin Breath Swallow	Irr immed Soap wash immed Resp support Medical attention immed	Eyes, skin, resp sys, liver, kidneys, CVS
[1,1-Dichloro-1-nitroethane]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet (flamem) N.R. Eyewash, Quick drench	NIOSH §: SCBAF-PD, PP/SAF-PD, PP/ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, skin, resp sys; eye, skin burns; lac; head, dizz; In animals: liver, kidney damage; [canc]	Eye: Skin: Breath: Swallow:	Irr immed Soap flush immed Resp support Medical attention Immed	Eyes, skin, resp sys, CNS, liver, kidneys [In animals: cancer of the bladder, liver, lung & forestomach]
[1,3-Dichloropropane]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R. Eyewash, Quick drench	TBAL	Inh Ing Con	Irrit eyes, skin, upper resp sys; eye, skin burns; lassa, loss of appetite, diarr, vomit, slowing of pulse; CNS depres	Eye: Skin: Breath: Swallow:	Irr immed Water flush immed Resp support Medical attention Immed	Eyes, skin, resp sys, GI tract, CNS
[2,2-Dichloropropionic acid]							

Chemical name, structural formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL, F.P., IP, Sp. Gr., flammability	VP, FRZ, UEL, LEL		
Dichlorotetrafluoro- ethane $\text{CClF}_2\text{CClF}_2$ 76-14-2 K1101000	1,2-Dichlorotetra- fluoroethane, Freon® 114; Cetron® 114; Halon® 242; Refrigerant 114	NIOSH/OSHA 1000 ppm (7000 mg/m ³)	15,000 ppm	Colorless gas with a faint ether like odor at high concentrations [Note: A liquid below 38°F Shipped as a liquefied compressed gas.]	MW 170.9 BP 38°F Sol: 0.01% F.P. NA IP 12-20 s.v.	VP (70°F): 1.9 mm FRZ -137°F UEL NA LEL NA	Chemically active metals such as sodium, potassium, calcium, powdered aluminum, zinc & magnesium, acids, acid fumes	Char (2); CH ₄ , Cl, GC/FID, II [#1018]
1958 12	1 ppm = 7.10 mg/m ³				RGasD: 5.93 Nonflammable Gas			
Dichlorvos (CH ₃) ₂ P(O)OCH=CCl ₂ 62-73-7 TC0350000	DDVP; 2,2-Dichlorovinyl dimethyl phosphate	NIOSH/OSHA 1 mg/m ³ [skin]	100 mg/m ³	Colorless to amber liquid with a mild chemical odor. [Note: Insecticide that may be absorbed on a dry carrier.]	MW 221.0 BP: Decomposes Sol: 0.5% F.P.: >175°F IP: ?	VP: 0.01 mm FRZ: ? UEL: ? LEL: ?	Strong acids, strong alkalis [Note: Corrosive to iron & mild steel.]	XAD-2 Toluene, GC/FID, II (S) [P&CAM #295]
2763 55	1 ppm = 9.19 mg/m ³				Sp. Gr (77°F): 1.42 Class III Combustible Liquid			
Dicrotophos $\text{C}_8\text{H}_{10}\text{NO}_5\text{P}$ 141-66-2 TC3350000	Bidrin®; Carbion®; 2-Dimethyl cis-2-dimethyl- carbamoyl-1-methylvinyl- phosphate [(CH ₃) ₂ P(O)OCH(CH ₃)=CHC(O)- none N(CH ₃) ₂]	NIOSH 0.25 mg/m ³ [skin] OSHA† none	N.D.	Yellow-brown liquid with a mild, ester odor. [Insecticide]	MW: 237.2 BP: 752°F Sol: Miscible F.P.: >200°F IP: ?	VP: 0.0001 mm FRZ: ? UEL: ? LEL: ?	Metals [Note: Corrosive to cast iron, mild steel, brass & stainless steel.]	None available
1 ppm = 9.86 mg/m ³					Sp. Gr (59°F): 1.22 Class IIIB Combustible Liquid			
Dicyclopentadiene $\text{C}_{10}\text{H}_{12}$ 77-73-6 PC1050000	Bicyclopentadiene; DCPD; 1,3-Dicyclopentadiene dimer; 3a,4,7,7a-Tetrahydro-4,7- methanoindene [Note: Exists in two stereoisomeric forms.]	NIOSH 5 ppm (30 mg/m ³) OSHA† none	N.D.	Colorless, crystal- line solid with a disagreeable, camphor-like odor. [Note: A liquid above 90°F.]	MW: 132.2 BP: 342°F Sol: 0.02% F.P. (oc): 90°F IP: ?	VP: 1.4 mm FRZ: 90°F UEL: 6.3% LEL: 0.8%	Oxidizers [Note: Depolymerizes at boiling point and forms two molecules of cyclopentadiene. Must be inhibited and maintained under an inert atmosphere to prevent polymerization.]	None available
2048 28	1 ppm = 6.60 mg/m ³				Sp. Gr: 0.96 (Liquid at 95°F) Class IC Flammable Liquid Combustible Solid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 6)	First aid (See Table 6)		Target organs (See Table 6)
Skin:	Frostbite	NIOSH/OSHA	Inh	Irrit resp sys; asphy;	Eye:	Frostbite	Resp sys, CVS
Eyes:	Frostbite	10,000 ppm: SA	Con	card arrhy, card arrest,	Skin:	Frostbite	
Wash skin:	N.R.	15,000 ppm: SA; CF/SCBAF/SAF	(Inq)	lg; frostbite	Breath:	Resp support	
Remove:	N.R.	§ SCBAF PD PP/SAF PD, PP ASCBA					
Change:	N.R.	Escape GMFOV/SCBAE					
Provide:	Frostbite						
[Dichlorotetrafluoroethane]							
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin, miosis;	Eye	Irrimed	Resp sys, CVS,
Eyes:	Prevent eye contact	10 mg/m ³ : SA	Ab	ache eyes, rhin, head,	Skin:	Soap wash immed	CNS, eyes, skin,
Wash skin:	When contam	25 mg/m ³ : SA CF	Ing	chest tight, wheez, lar	Breath:	Resp support	blood chol
Remove:	When wet or contam	50 mg/m ³ : SAT CF/SCBAF/SAF	Con	spasm, saliv, cyan; anor,	Swallow:	Medical attention immed	
Change:	N.R.	100 mg/m ³ : SA; PD, PP		nau, vomit, diarr, sweat,			
		§ SCBAF PD PP/SAF PD, PP ASCBA		muscl fasc, para, gidd,			
		Escape GMFOVHE/SCBAE		ataxia, convuls, low BP, card irreg			
[Dichlorvos]							
Skin:	Prevent skin contact	TBAL	Inh	Head, nau, dizz, aridely,	Eye:	Irr Immed	CNS, blood chol
Eyes:	Prevent eye contact		Ab	restless, muscl twitch,	Skin:	Water wash immed	
Wash skin:	When contam		Ing	weak, tremor, Inco, vomit,	Breath:	Resp support	
Remove:	When wet or contam		Con	abdom cramps, diarr; saliv,	Swallow:	Medical attention immed	
Change:	Daily			sweat, lac, rhinitis; anor,			
Provide:	Quick drench			mal			
[Dicrotophos]							
Skin:	Prevent skin contact	TBAL	Inh	Irrit eyes, skin, nose,	Eye:	Irr Immed	Eyes, skin, resp sys,
Eyes:	Prevent eye contact		Ing	throat; Inco, head; sneez,	Skin:	Soap flush immed	CNS, kidneys
Wash skin:	When contam		Con	cough; skin blisters;	Breath:	Resp support	
Remove:	When wet or contam			In animals: kidney, lung damage	Swallow:	Medical attention immed	
Change:	Daily						
Provide:	Eyewash, Quick drench						
[Dicyclopentadiene]							

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TLWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, Flammability	VP, FRZ UEL, LEL		
Dicyclopentadienyl iron (C ₁₀ H ₈) ₂ Fe 102-54-5 LK0700000	bis(Cyclopentadienyl)(Iron, Ferrocene, iron dicyclopentadienyl	NIOSH 10 mg/m ³ (total) 5 mg/m ³ (resp) OSHA† 15 mg/m ³ (total) 5 mg/m ³ (resp)	N.D.	Orange, crystalline solid with a camphor-like odor.	MW: 186.1 BP: 480°F Sol: Insoluble FLP: 7 IP: 6.88 eV Sp.Gr: 7 Combustible Solid	VP: 7 MLT: 343°F UEL: 7 LEL: 7	Ammonium perchlorate, tetranitromethane, mercury(II) nitrate	None available
Dieldrin C ₁₂ H ₈ Cl ₆ O 60-57-1 IO1750000 2761 55	HEOD 1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4-endo,exo-5,8-dimethanonaphthalene	NIOSH Ca See Appendix A 0.25 mg/m ³ [skin] OSHA 0.25 mg/m ³ [skin]	Ca [50 mg/m ³]	Colorless to light-tan crystals with a mild, chemical odor. [insecticide]	MW: 380.9 BP: Decomposes Sol: 0.02% FLP: NA IP: 7 Sp.Gr: 1.75 Noncombustible Solid	VP(77°F): 8 x 10 ⁻⁴ mm MLT: 349°F UEL: NA LEL: NA	Strong oxidizers, active metals such as sodium, strong acids, phenols	Filter; Isocane; GC/EC; II(3) [#5283]
Diesel exhaust	Synonyms vary depending upon the specific diesel exhaust component.	NIOSH Ca See Appendix A OSHA none	Ca [N.D.]	Appearance and odor vary depending upon the specific diesel exhaust component.	Properties vary depending upon the specific diesel exhaust component.	Varies	Varies	
Diethanolamine (HOCH ₂ CH ₂) ₂ NH 111-42-2 KL2975000	DEA; Di(2-hydroxyethyl)amine; 2,2'-Dihydroxydiethylamine; Diolenine; bis(2-Hydroxyethyl)amine; 2,2'-iminodiethanol 1 ppm = 4.37 mg/m ³	NIOSH 3 ppm (15 mg/m ³) OSHA† none	N.D.	Colorless crystals or a syrupy, white liquid (above 82°F) with a mild, ammonia-like odor.	MW: 105.2 BP: 516°F (Decomposes) Sol: 95% FLP: 279°F IP: 7 Sp.Gr: 1.10 Class IIB Combustible Liquid Combustible Solid	VP: <0.01 mm MLT: 82°F UEL: 9.8% LEL: 1.6%	Oxidizers, strong acids, acid anhydrides, halides [Note: Reacts with CO ₂ in the air. Hygroscopic (i.e., absorbs moisture from the air). Corrosive to copper, zinc & galvanized iron.]	Imp; Reagent; IC; II [#3509, Amino-ethanol Compounds II]

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)		Target organs (See Table 6)
Skin:	N.R.	TBAL	Inh	Possible irrit eyes, skin,	Eye:	Irrigated	Eyes, skin, resp sys,
Eyes:	N.R.		ing	resp sys;	Skin:	Soap wash	liver, blood, repro sys
Wash skin:	N.R.		Con	In animals: liver, RBC, testicular changes	Breath:	Resp support	
Remove:	N.R.				Swallow:	Medical attention	
Change:	Daily					Irrigated	
[Dicyclopentadienyliron]							
Skin:	Prevent skin contact	NIOSH	Inh	Head, dizz, nau, vomit,	Eye:	Irrigated	CNS, liver,
Eyes:	Prevent eye contact	#: SCBAF:PD,PP/SAF:PD,PP:ASCBA	Abs	mal, sweat, myoclonic	Skin:	Soap wash	kidneys, skin
Wash skin:	When contam/Daily	Escape: GMFOVHE/SCBAE	ing	limb jerks, clonic, tonic	Breath:	Resp support	[In animals: lung,
Remove:	When wet or contam		Con	convuls, coma, [carc],	Swallow:	Medical attention	liver, thyroid &
Change:	Daily			in animals: liver, kidney		Irrigated	adrenal gland
Provide:	Eyewash, Quick drench			damage			tumors]
[Dieldrin]							
Skin:	N.R.	NIOSH	Inh	Eye irrit, pulm func	Breath:	Resp support	Eyes, resp sys
Eyes:	N.R.	#: SCBAF:PD,PP/SAF:PD,PP:ASCBA	Con	changes; [carc]			[In animals:
Wash skin:	N.R.	Escape: GMFOVHE/SCBAE					lung tumors]
Remove:	N.R.						
Change:	N.R.						
[Diesel exhaust]							
Skin:	Prevent skin contact	TBAL	Inh	Irrit eyes, skin, nose,	Eye:	Irrigated	Eyes, skin, resp sys
Eyes:	Prevent eye contact		ing	throat; eye burns, corn nec;	Skin:	Water flush	
Wash skin:	When contam		Con	skin burns; lac, cough,	Breath:	Resp support	
Remove:	When wet or contam			sneez	Swallow:	Medical attention	
Change:	Daily					Irrigated	
Provide:	Eyewash, Quick drench						
[Diethanolamine]							

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide No.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Diethylamine (C ₄ H ₁₁ NH) 109-89-7 HZ8750000	Diethylamine N,N-Diethylamine, N-Ethylethanamine	NIOSH 10 ppm (30 mg/m ³) ST 25 ppm (75 mg/m ³) OSHA† 25 ppm (75 mg/m ³)	200 ppm	Colorless liquid with a fishy, ammonia-like odor.	MW 73.1 BP 132°F Sol: Miscible FLP: -15°F IP: 8.01 eV	VP 192 mm FRZ -58°F UEL 10.1% LEL 1.8%	Strong oxidizers, strong acids, cellulose nitrate	Si gel, H ₂ SO ₄ / Methanol; GC/FID; III [#2010]
1154 68	1 ppm = 3.04 mg/m ³				Sp Gr 0.71 Class IB Flammable Liquid			
2-Diethylaminoethanol (C ₆ H ₁₅ NCH ₂ CH ₂ OH) 100-37-8 KK5075000	Diethylaminoethanol, 2-Diethylaminoethyl alcohol, N,N-Diethylethanolamine, Diethyl-(2-hydroxyethyl)- amine 2-Hydroxytriethylamine	NIOSH/OSHA 10 ppm (50 mg/m ³) [skin]	100 ppm	Colorless liquid with a nauseating, ammonia-like odor.	MW 117.2 BP 325°F Sol: Miscible FLP 126°F IP: ?	VP 1 mm FRZ -94°F UEL ? LEL ?	Strong oxidizers, strong acids	Si gel, Methanol, GC/FID; III [#2007, Amino- ethanol Com- pounds]
2686 29	1 ppm = 4.67 mg/m ³				Sp Gr 0.89 Class II Combustible Liquid			
Diethylenetriamine (NH ₂ CH ₂ CH ₂) ₃ NH 111-40-6 IE1226000	N-(2-Aminoethyl)N,2- bis(2-Aminoethyl)amine; DETA; 2,2'-Diaminodithylenamine	NIOSH 1 ppm (4 mg/m ³) [skin] OSHA† none	N.D.	Colorless to yellow liquid with a strong, ammonia-like odor. [Note: Hygroscopic (i.e., absorb moisture from the air).]	MW: 103.2 BP: 405°F Sol: Miscible FLP: 208°F IP: ?	VP: 0.4 mm FRZ: -38°F UEL: 6.7% LEL: 2%	Oxidizers, strong acids, cellulose nitrate [Note: May form explosive complexes with silver, cobalt, or chromium compounds. Corrosive to aluminum, copper, brass & zinc.]	XAD-2; DMF; HPLC/UV/D; III [#2540]
2079 29	1 ppm = 4.29 mg/m ³				Sp Gr: 0.96 Class IIIB Combustible Liquid			
Diethyl ketone CH ₃ CH ₂ COCH ₂ CH ₃ 86-22-8 SA8050000	DEK, Dimethylacetone, Ethyl ketone, Methylacetone, 3-Pentanone, Propione	NIOSH 200 ppm (766 mg/m ³) OSHA† none	N.D.	Colorless liquid with an acetone-like odor.	MW: 86.2 BP: 215°F Sol: 5% FLP: 56°F IP: 9.32 eV	VP (77°F): 35 mm FRZ: -44°F UEL: 8.4% LEL: 1.6%	Strong oxidizers, alkalis, mineral acids, (hydrogen peroxide + nitric acid)	None available
1166 26	1 ppm = 3.56 mg/m ³				Sp Gr: 0.81 Class IB Flammable Liquid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet (flamm) N.R. Eyewash (>0.5%), Quick drench (liq)	NIOSH 200 ppm: SA:CF/PAPRS/CCRFS/ GMFS/SCBAF/SAF § SCBAF PD PP/SAF PD PP ASCBA Escape: GMFS/SCBAE	Inh Abs Ing Con	Irrit eyes, skin, resp sys, in animals: myocardial degeneration	Eye Skin Breath Swallow Irr immed Water flush immed Resp support Medical attention immed	Eyes, skin, resp sys CVS
[Diethylamine]						
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R. Eyewash (>5%), Quick drench	NIOSH/OSHA 100 ppm: CCROV*/GMFOV/PAPROV*/ SA*/SCBAF § SCBAF PD PP/SAF PD PP ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, skin, resp sys, nausea, vomit	Eye Skin Breath Swallow Irr immed Water flush immed Resp support Medical attention immed	Eyes, skin, resp sys
[2-Diethylaminoethanol]						
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R. Eyewash, Quick drench	TBAL	Inh Abs Ing Con	Irrit eyes, skin, muc memb, upper resp sys; dermat, skin sens; eye, skin nec; cough, dysp, pulm sens	Eye: Skin: Breath: Swallow: Irr immed Water flush immed Resp support Medical attention immed	Eyes, skin, resp sys
[Diethylenetriamine]						
Skin: Eyes: Wash skin: Remove: Change:	N.R. Prevent eye contact Daily When wet (flamm) N.R.	TBAL	Inh Ing Con	Irrit eyes, skin, muc memb, resp sys; cough, sneez	Eye: Skin: Breath: Swallow: Irr immed Soap wash Resp support Medical attention immed	Eyes, skin, resp sys
[Diethyl ketone]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TLV unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL, FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Diethyl phthalate $C_6H_4(COOC_2H_5)_2$ 84-66-2 T11050000	DEP, Diethyl ester of phthalic acid, Ethyl phthalate	NIOSH 5 mg/m ³ OSHA† none	N.D.	Colorless to water- white, oily liquid with a very slight, aromatic odor. [pesticide]	MW: 222.3 BP: 563°F Sol: 77°F: 0.1% FLP(oc): 322°F IP: 7	VP(77°F): 0.002 mm FRZ: -41°F UEL: 7 LEL(368°F): 0.7%	Strong oxidizers, strong acids, nitric acid, permanganates, water	None available
	1 ppm = 9.24 mg/m ³				Sp Gr: 1.12 Class III B Combustible Liquid; however, ignition is difficult.			
Difluorodibromomethane CF_2Br_2 75-61-6 PA7525000	DiBromodifluoromethane, Freon® 12B2, Halon® 1202	NIOSH/OSHA 100 ppm (860 mg/m ³)	2000 ppm	Colorless, heavy liquid or gas (above 76°F) with a characteristic odor.	MW: 209.8 BP: 76°F Sol: Insoluble FLP: NA IP: 11.07 eV	VP: 620 mm FRZ: -231°F UEL: NA LEL: NA	Chemically-active metals such as sodium, potassium, calcium, powdered aluminum, zinc & magnesium	Char(2), 2-Propanol, GC/FID, II [#1012]
	1 ppm = 8.72 mg/m ³				Sp Gr(59°F): 2.29 Noncombustible Liquid Nonflammable Gas			
Diglycidyl ether $C_6H_8O_3$ 2238-07-5 KN2350000	DGE, Diglycidyl ether oxide, Di(2,3-epoxypropyl) ether, 2-Epoxypropyl ether, bis(2,3-Epoxypropyl) ether	NIOSH Ca See Appendix A 0.1 ppm (0.5 mg/m ³) OSHA† 0.5 ppm (2.8 mg/m ³)	Ca [10 ppm]	Colorless liquid with a strong, irritating odor.	MW: 130.2 BP: 500°F Sol: 7 FLP: 147°F IP: 7	VP(77°F): 0.09 mm FRZ: 7 UEL: 7 LEL: 7	Strong oxidizers	None available
	1 ppm = 5.41 mg/m ³				Sp Gr: 1.12 Class IIIA Combustible Liquid			
Diisobutyl ketone [(CH ₃) ₂ CHCH ₂ CH ₂ CO 108-83-8 MJ5775000	DIBK, sym-Diisopropyl acetone, 2,6-Dimethyl-4-heptanone, Isovalerone, Valerone	NIOSH 25 ppm (150 mg/m ³) OSHA† 50 ppm (290 mg/m ³)	500 ppm	Colorless liquid with a mild, sweet odor.	MW: 142.3 BP: 334°F Sol: 0.05% FLP: 120°F IP: 9.04 eV	VP: 2 mm FRZ: -43°F UEL(200°F): 7% LEL(200°F): 0.6%	Strong oxidizers	Char, CS, GC/FID, II [#1300, Ketones I]
	1 ppm = 5.92 mg/m ³				Sp Gr: 0.81 Class II Combustible Liquid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)		Target organs (See Table 5)
Skin:	N.R.	TBAL	Inh	Irrit eyes, skin, nose,	Eye:	Inn. Immed	Eyes, skin, resp sys,
Eyes:	N.R.		Ing	throat; head, dizz, nau;	Skin:	Wash regularly	CNS, PNS, repro sys
Wash skin:	N.R.		Con	lacr; possible polynEur,	Breath:	Resp support	
Remove:	N.R.			vestibular dysfunc; pain,	Swallow:	Medical attention	
Change:	N.R.			numb, weak, spasms in		Immed	
				arms & legs;			
				In animals: repro effects			
[Diethyl phthalate]							
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	In animals: irrit resp sys	Eye	Inn. Immed	Resp sys: CNS,
Eyes:	Prevent eye contact	1000 ppm: SA	Ing	CNS symptoms, liver damage	Skin	Water flush imm	liver
Wash skin:	N.R.	2000 ppm: SA; CF/SCBAF/SAF	Con		Breath	Resp support	
Remove:	When wet or contam	§ SCBAF PD PP/SAF PD PP ASCBA			Swallow	Medical attention	
Change:	N.R.	Escape: GMFOV/SCBAE				Immed	
[Difluorodibromomethane]							
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, skin, resp sys,	Eye	Inn. Immed	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	§ SCBAF PD PP/SAF PD PP ASCBA	Abs	skin burns,	Skin	Soap wash imm	repro sys
Wash skin:	When contam/Daily	Escape: GMFOV/SCBAE	Ing	In animals: hemato sys,	Breath	Resp support	[In animals:
Remove:	When wet or contam		Con	lung, liver, kidney	Swallow	Medical attention	skin tumors]
Change:	Daily			damage, repro effects,		Immed	
Provide:	Eyewash, Quick drench			[care]			
[Diglycidyl ether]							
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, skin, nose,	Eye	Inn. Immed	Eyes, skin, resp sys,
Eyes:	N.R.	500 ppm: SA; CF/PAPROV/CCRFOV/	Ing	throat; head, dizz, derm,	Skin	Soap wash prompt	CNS, liver, kidney
Wash skin:	When contam	GMFOV/SCBAF/SAF	Con	liver, kidney damage	Breath	Resp support	
Remove:	When wet or contam	§ SCBAF PD PP/SAF PD PP ASCBA			Swallow	Medical attention	
Change:	N.R.	Escape: GMFOV/SCBAE				Immed	
[Diisobutyl ketone]							

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL F.P., IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Diisopropylamine $[(CH_3)_2CH]_2NH$ 108-18-9 IM4025000	DIPA, N-(1-Methyl-ethyl)-2- propanamine	NIOSH/OSHA 5 ppm (20 mg/m ³) [skin]	200 ppm	Colorless liquid with an ammonia- or fish-like odor	MW 101.2 BP 183°F Sol Miscible F.P. 20°F IP 7.73 eV	VP 70 mm FRZ -141°F UEL 7.1% LEL 1.1%	Strong oxidizers, strong acids	Imp. KOH, GC/FID, II(4) [#S141]
1158 68	1 ppm = 4.21 mg/m ³				Sp Gr. 0.72 Class IB Flammable Liquid			
Dimethyl acetamide $CH_3CON(CH_3)_2$ 127-19-5 AB7700000	N,N-Dimethyl acetamide, DMAc	NIOSH/OSHA 10 ppm (35 mg/m ³) [skin]	300 ppm	Colorless liquid with a weak ammonia- or fish- like odor	MW 87.1 BP 329°F Sol Miscible F.P.(oc) 158°F IP 8.81 eV	VP 2 mm FRZ -4°F UEL(320°F) 11.5% LEL(212°F) 1.8%	Carbon tetrachloride, other halogenated compounds when in contact with iron, oxidizers	Si gel Methanol, GC/FID, III [#2004]
	1 ppm = 3.62 mg/m ³				Sp Gr. 0.94 Class IIA Combustible Liquid			
Dimethylamine $(CH_3)_2NH$ 124-40-3 IPB750000	Dimethylamine (anhydrous), N-Methylmethanamine	NIOSH/OSHA 10 ppm (18 mg/m ³)	500 ppm	Colorless gas with an ammonia- or fish-like odor [Note: A liquid below 44°F Shipped as a liquefied compressed gas]	MW 45.1 BP 44°F Sol(140°F) 24% F.P. NA (Gas) 20°F (Liq) IP 8.24 eV RGasD: 1.58 Sp Gr. 0.67 (Liquid at 44°F) Flammable Gas/Class IA Flammable Liquid	VP 1.7 atm FRZ -134°F UEL 14.4% LEL 2.8%	Strong oxidizers, chlorine, mercury, acetaldehyde, fluorides, maleic anhydride, aluminum, brass, copper, zinc	Si gel, H ₂ SO ₄ , Methanol, GC/FID, III [#2010]
1032 19 (anhydrous) 1160 26 (solution)	1 ppm = 1.87 mg/m ³							
4-Dimethylamino- azobenzene $C_6H_5NNC_6H_4N(CH_3)_2$ 60-11-7 BX7350000	Butter yellow; DAB; p-Dimethylaminoazobenzene; N,N-Dimethyl-4-aminoazo- benzene, Methyl yellow	NIOSH Ca See Appendix A OSHA(1910.1015) See Appendix B	Ca [N.D.]	Yellow, leaf- shaped crystals	MW 225.3 BP Sublimes Sol: 0.001% F.P. ? IP ?	VP: 0.0000003 mm(est.) MLT 237°F UEL ? LEL ?	None reported	G-chrom. P, 2-Propanol, GC/FID, II(4), [P&CAM #284]

Sp Gr ?

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin, resp sys,	Eye	Eyes, skin, resp sys
Eyes:	Prevent eye contact (>6%)	125 ppm: SA CF/PAPROV*	Abs	nau, vomit, head, vis dist	Skin	
Wash skin:	When contam	200 ppm: CCRFOV/GMFOV/PAPRTOV*/	Inh		Breath	
Remove:	When wet (flam)	SCBAF/SAF	Ing		Swallow	
Change:	N.R.	§ SCBAF PD PP/SAF PD PP ASCBA	Con			
Provide:	Eyewash (>6%)	Escape GMFOV/SCBAE				
[Diisopropylamine]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit skin, jaun, liver	Eye	Skin, liver, CNS
Eyes:	Prevent eye contact	100 ppm: SA	Abs	damage, depres, leth,	Skin	
Wash skin:	When contam	250 ppm: SA CF	Ing	hallu, delusions	Breath:	
Remove:	When wet or contam	300 ppm: SCBAF/SAF	Con		Swallow	
Change:	N.R.	§ SCBAF PD PP/SAF PD PP ASCBA				
Provide:	Quick drench	Escape GMFOV/SCBAE				
[Dimethyl acetamide]						
Skin:	Prevent skin contact (liq)/ Frostbite	NIOSH/OSHA	Inh	Irrit nose, throat,	Eye	Eyes, skin, resp sys
Eyes:	Prevent eye contact (liq)/ Frostbite	250 ppm: SA CF*	Con	anex, cough, dysp,	Skin	
Wash skin:	When contam (liq)	500 ppm: SCBAF/SAF	(liq)	pulm edema, cong, dem,	Breath	
Remove:	When wet (flam)	§ SCBAF PD PP/SAF PD PP ASCBA		liq: frostbite		
Change:	N.R.	Escape GMFS/SCBAE				
Provide:	Eyewash (liq), Quick drench (liq), Frostbite					
[Dimethylamine]						
Skin:	Prevent skin contact	NIOSH	Inh	Enlarged liver, liver,	Eye	Skin, resp sys,
Eyes:	Prevent eye contact	§ SCBAF PD PP/SAF PD PP ASCBA	Abs	kidney dysfunc, contact	Skin	liver, kidneys,
Wash skin:	When contam/Daily	Escape HIEF/SCBAE	Ing	derm, cough, wheez, dysp;	Breath	bladder
Remove:	When wet or contam		Con	bloody sputum, bronchial	Swallow	[in animals:
Change:	Daily			secretions, frequent		liver & bladder
Provide:	Eyewash, Quick drench			urination, hema, dysuria, [canc]		tumors]
[4-Dimethylaminoozobenzene]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TLV unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
bis(2-(Dimethylamino)- ethyl)ether $C_8H_{20}N_2O$ 3033-62-3 KR9460000	NIAX® A99; NIAX® Catalyst A1; 2,2'-Oxybis(N,N-dimethyl ethylamine) [(CH ₃) ₂ NCH ₂ CH ₂ OCH ₂ CH ₂ N(CH ₃) ₂] [Note: A component (8%) of NIAX® Catalyst ESN, along with dimethylaminopropio- nitrile (95%).] 1 ppm = 6.67 mg/m ³	NIOSH/OSHA See Appendix C (NIAX® Catalyst ESN)	N.D.	Liquid.	MW: 160.3 BP: 372°F Sol: ? FLP: ? IP: ? Sp.Gr: ?	VP: ? FRZ: ? UEL: ? LEL: ?	None reported	None available
Dimethylamino- propionitrile $(CH_3)_2NCH_2CH_2CN$ 1738-25-6 UG1576000	3-(Dimethylamino)- propionitrile; N,N-Dimethylamino-3- propionitrile [Note: A component (85%) of NIAX® Catalyst ESN, along with bis(2-(dimethylamino)- ethyl) ether (8%).] 1 ppm = 4.08 mg/m ³	NIOSH/OSHA See Appendix C (NIAX® Catalyst ESN)	N.D.	Colorless liquid.	MW: 98.2 BP: 342°F Sol: Miscible FLP: 147°F IP: ? Sp.Gr(86°F): 0.86 Class IIIA Combustible Liquid	VP(135°F): 10mm FRZ: -48°F UEL: ? LEL: ?	Oxidizers [Note: Emits toxic oxides of nitrogen and cyanide fumes when heated to decomposition.]	None available
N,N-Dimethylaniline $C_8H_9N(CH_3)_2$ 121-69-7 BX4725000	N,N-Dimethylbenzylamine; N,N-Dimethylphenylamine [Note: Also known as Dimethylaniline which is a correct synonym for Xylidine.] 1 ppm = 5.04 mg/m ³	NIOSH 5 ppm (25 mg/m ³) ST 10 ppm (50 mg/m ³) (skin) OSHA† 5 ppm (25 mg/m ³) (skin)	100 ppm	Pale-yellow, oily liquid with an amine-like odor. [Note: A solid below 36°F.]	MW 121.2 BP 378°F Sol 2% FLP 142°F IP 7 14 eV Sp Gr 0.96 Class IIIA Combustible Liquid	VP 1 mm FRZ 36°F UEL ? LEL ?	Strong oxidizers, strong acids, benzoyl peroxide	Si gel; Ethanol; GC/FID; III [#2002 Aromatic Amines]
Dimethyl carbamoyl chloride $(CH_3)_2NCOCl$ 79-44-7 FD4200000	Chloroformic acid dimethylamide; Dimethylcarbamoyl chloride; N,N-Dimethylcarbamoyl chloride; DMCC 1 ppm = 4.47 mg/m ³	NIOSH Ca See Appendix A OSHA none	Ca [N.D.]	Clear, colorless liquid.	MW: 107.6 BP: 329°F Sol: Reacts FLP: 156°F IP: ? Sp.Gr: 1.17 Class IIIA Combustible Liquid	VP: ? FRZ: -27°F UEL: ? LEL: ?	Acids, water [Note: Rapidly hydrolyzes in water to dimethylamine, carbon dioxide, and hydrogen chloride.]	None available

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	Prevent skin contact	NIOSH				
Eyes:	Prevent eye contact	W: SCBAF; PD, PP/SAF; PD, PP/ASCBA	Inh	Possible urinary dysfunction; neurological disorders;	Eye:	Eye, skin, urinary tract, PNS
Wash skin:	When contam	Escape: GMFOV/SCBAE	Abs	In animals: irrit eyes, skin	Skin:	
Remove:	When wet or contam		Ing		Breath:	
Change:	N.R.		Con		Swallow:	
Provide:	Eyewash, Quick drench					
[bis[2-(Dimethylamino)ethyl]ether]						
Skin:	Prevent skin contact	NIOSH				
Eyes:	Prevent eye contact	W: SCBAF; PD, PP/SAF; PD, PP/ASCBA	Inh	Irrit eyes, skin; urinary dysfunction; neurological disorders; pins & needles in	Eye:	Eye, skin, urinary tract, PNS
Wash skin:	When contam	Escape: GMFOV/SCBAE	Abs	hands & feet; muscle weak,	Skin:	
Remove:	When wet or contam		Ing	less, nau, vomit; decr nerve	Breath:	
Change:	N.R.		Con	conduction in lower legs	Swallow:	
Provide:	Eyewash, Quick drench					
[Dimethylaminopropionitrile]						
Skin:	Prevent skin contact	NIOSH/OSHA				
Eyes:	Prevent eye contact	50 ppm: SA	Inh	Anoxia symptoms: cyan,	Eye:	Blood, kidneys,
Wash skin:	When contam	100 ppm: SA CF/SCBAF/SAF	Abs	weak, dizz, ataxia, methemo	Skin:	liver, CVS
Remove:	When wet or contam	5: SCBAF; PD, PP/SAF; PD, PP/ASCBA	Ing		Breath:	
Change:	N.R.	Escape: GMFOV/SCBAE	Con		Swallow:	
Provide:	Quick drench					
[N,N-Dimethylaniline]						
Skin:	Prevent skin contact	NIOSH				
Eyes:	Prevent eye contact	W: SCBAF; PD, PP/SAF; PD, PP/ASCBA	Inh	Irrit eyes, skin, nose,	Eye:	Eye, skin, resp eye,
Wash skin:	When contam	Escape: GMFOV/SCBAE	Abs	throat, resp eye; eye,	Skin:	liver
Remove:	When wet or contam		Ing	skin burns; cough, wheez,	Breath:	[in animals:
Change:	N.R.		Con	laryngitis, dysp; head,	Swallow:	nasal cancer]
Provide:	Eyewash, Quick drench			nau, vomit; liver inj; [canc]		
[Dimethyl carbamoyl chloride]						

Chemical name, structure formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Dimethyl-1,2-dibromo- 2,2-dichloroethyl phosphate (CH ₃) ₂ P(O)OCHBr- CBrCl ₂ 300-76-5 TB9450000	DibromB; 1,2-Dibromo-2,2-dichloro- ethyl dimethyl phosphate. Naied	NIOSH 3 mg/m ³ [skin] OSHA† 3 mg/m ³	200 mg/m ³	Colorless to white solid or straw- colored liquid (above 80°F) with a slightly pungent odor [insecticide]	MW 380.8 BP Decomposes Sol Insoluble FLP NA IP 7 Sp Gr(77°F) 1.96 Noncombustible Solid	VP 0.0002 mm MLT 80°F UEL NA LEL NA	Strong oxidizers, acids, sunlight, water [Note: Corrosive to metals. Hydrolyzed in presence of water.]	None available
Dimethylformamide HCON(CH ₃) ₂ 68-12-2 LQ2100000	Dimethyl formamide, N,N-Dimethylformamide, DMF	NIOSH/OSHA 10 ppm (30 mg/m ³) [skin]	500 ppm	Colorless to pale- yellow liquid with a faint, amine- like odor.	MW 73.1 BP 307°F Sol Miscible FLP 136°F IP 9.12 eV Sp Gr 0.95 Class II Combustible Liquid	VP 3 mm FRZ -78°F UEL 15.2% LEL(212°F) 2.2%	Carbon tetrachloride, other halogenated compounds when in contact with iron; strong oxidizers; alkyl aluminums, inorganic nitrates	Si gel, Methanol, GC/FID, IR [#2004]
2265 26	1 ppm = 3.04 mg/m ³							
1,1-Dimethylhydrazine (CH ₃) ₂ NNH ₂ 57-14-7 MV2450000	Dimazine, DMH, UDMH, Unsymmetrical dimethyl- hydrazine	NIOSH Ca See Appendix A C 0.6 ppm (0.15 mg/m ³) [2-hr] OSHA 0.5 ppm (1 mg/m ³) [skin]	Ca [15 ppm]	Colorless liquid with an ammonia- or fish-like odor	MW 60.1 BP 147°F Sol Miscible FLP 5°F IP 8.05 eV Sp Gr 0.79 Class IB Flammable Liquid	VP 103 mm FRZ -72°F UEL 95% LEL 2%	Oxidizers, halogens, metallic mercury, fuming nitric acid, hydrogen peroxide [Note: May ignite SPONTANEOUSLY in contact with oxidizers.]	Sub: Pho-acid; Vib: IR [#5143]
1163 57	1 ppm = 2.50 mg/m ³							
Dimethylphthalate C ₆ H ₄ (COOCH ₃) ₂ 131-11-3 T11570000	Dimethyl ester of 1,2-benzenedicarboxylic acid, DMP	NIOSH/OSHA 5 mg/m ³	2000 mg/m ³	Colorless, oily liquid with a slight, aromatic odor. [Note: A solid below 42°F.]	MW 194.2 BP 543°F Sol 0.4% FLP 295°F IP 9.64 eV Sp Gr 1.19 Class IIIB Combustible Liquid, however, ignition is difficult	VP 0.01 mm FRZ 42°F UEL 7% LEL(358°F) 0.9%	Nitrates, strong oxidizers, alkalis & acids	None available
9188 31	1 ppm = 8.07 mg/m ³							

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irritates eyes, skin, mucous	Eye	Eyes, skin, resp sys
Eyes:	Prevent eye contact	30 mg/m ³ DMFw/HE/SA	Abs	fac. head, chest tight,	Skinned	CNS, CVS, blood chcl
Wash skin:	When contam	75 mg/m ³ SA CF/PAPRDMF	Ing	wheez, lar spasm, saliv,	Breath	
Remove:	When wet or contam	150 mg/m ³ HEF/SAT CF/PAPRTHIE/SCBAF/SAF	Con	cyan anox nau vomit, abdom cramp, diarr, weak, twitch para gidd, ataxia, convuls, low BP, card irreg	Swallow	
Change:	Daily	200 mg/m ³ SA/PD,PP				
Provide:	Eyewash	§ SCBAF PD PP/SAF PD,PP ASCBA Escape HEF/SCBAE				
[Dimethyl-1,2-dibromo-2,2-dichloroethyl phosphate]						
Skin:	Prevent skin contact	NIOSH	Inh	Irritates eyes, skin, resp sys;	Eye	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	100 ppm SA*	Abs	nau, vomit, colic, liver	Skinned	liver, kidneys, CVS
Wash skin:	When contam	250 ppm SA CF*	Ing	damage enlarged liver;	Breath	
Remove:	When wet or contam	500 ppm SAT CF*/SCBAF/SAF	Con	high BP, face flush, dermat, in animals kidney, heart damage	Swallow	
Change:	N.R.	§ SCBAF PD PP/SAF PD,PP ASCBA Escape GMFOV/SCBAE				
[Dimethylformamide]						
Skin:	Prevent skin contact	NIOSH	Inh	Irritates eyes, skin, choking,	Eye	CNS, liver, GI
Eyes:	Prevent eye contact	§ SCBAF PD PP/SAF PD,PP ASCBA	Abs	chest pain, dysp, leth,	Skinned	tract, blood
Wash skin:	When contam	Escape GMFS/SCBAE	Ing	nau, anoxia, convuls, liver	Breath	resp sys, eyes,
Remove:	When wet (flamm)		Con	ing, [carc]	Swallow	skin
Change:	N.R.					[in animals:
Provide:	Eyewash, Quick drench					tumors of the
						lungs, liver,
						blood vessels & intestines]
[1,1-Dimethylhydrazine]						
Skin:	N.R.	NIOSH/OSHA	Inh	Irritates eyes, upper resp sys,	Eye	Eyes, resp sys, GI
Eyes:	Prevent eye contact	50 mg/m ³ DMF	Ing	stomach pain	Skinned	tract
Wash skin:	N.R.	125 mg/m ³ SA CF/PAPRDMF	Con		Breath	
Remove:	N.R.	250 mg/m ³ HEF/SCBAF/SAF			Swallow	
Change:	N.R.	2000 mg/m ³ SAF/PD,PP				
		§ SCBAF PD PP/SAF PD,PP ASCBA Escape HEF/SCBAE				

[Dimethylphthalate]

Chemical name, structure formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Dimethyl sulfate (CH ₃) ₂ SO ₄ 77-78-1 WS8225000	Dimethyl ester of sulfuric acid Dimethylsulfate Methyl sulfate	NIOSH Ca See Appendix A 0.1 ppm (0.5 mg/m ³) [skin] OSHA† 1 ppm (5 mg/m ³) [skin]	Ca [7 ppm]	Colorless, oily liquid with a faint, onion-like odor.	MW: 126.1 BP: 370°F (Decomposes) Sol: (54°F) 3% F.P. 182°F IP: ?	VP: 0.1 mm FRZ: -25°F UEL: ? LEL: ?	Strong oxidizers, ammonia solutions [Note: Decomposes in water to sulfuric acid, corrosive to metals]	Porapak-P, Diethyl ether, GC/EConD, II, [2524]
1595 57	1 ppm = 5.24 mg/m ³				Sp Gr: 1.33 Class IIIA Combustible Liquid			
Dinitolide (NO ₂) ₂ C ₆ H ₄ (CH ₂)CONH ₂ 148-01-6 XS4200000	3,5-Dinitro-o-toluidamide; 2-Methyl-3,5-dinitrobenzamide; Zolene	NIOSH 5 mg/m ³ OSHA† none	N.D.	Yellowish, crystalline solid.	MW: 225.2 BP: ? Sol: Slight FLP: NA IP: ?	VP: ? MLT: 351°F UEL: NA LEL: NA	None reported	Filter; none; Grav; II, [2550, Nuisance Dust (total)]
					Sp Gr: ? Noncombustible Solid			
o-Dinitrobenzene C ₆ H ₄ (NO ₂) ₂ 528-29-0 CZ7450000	ortho-Dinitrobenzene; 1,2-Dinitrobenzene	NIOSH/OSHA 1 mg/m ³ [skin]	50 mg/m ³	Pale white or yellow, crystalline solid.	MW: 168.1 BP: 606°F Sol: 0.05% F.P. 302°F IP: 10.71 eV	VP: ? MLT: 244°F UEL: ? LEL: ?	Strong oxidizers, caustics, metals such as tin & zinc [Note: Prolonged exposure to fire and heat may result in an explosion due to SPONTANEOUS decomposition]	Filter/IIb; Methanol, HPLC/UV/D, II(4), [25214]
1597 56					Sp Gr: 1.57 Combustible Solid			
m-Dinitrobenzene C ₆ H ₄ (NO ₂) ₂ 99-65-0 CZ7350000	meta-Dinitrobenzene; 1,3-Dinitrobenzene	NIOSH/OSHA 1 mg/m ³ [skin]	50 mg/m ³	Pale white or yellow, crystalline solid.	MW: 168.1 BP: 572°F Sol: 0.02% F.P. 302°F IP: 10.43 eV	VP: ? MLT: 192°F UEL: ? LEL: ?	Strong oxidizers, caustics, metals such as tin & zinc [Note: Prolonged exposure to fire and heat may result in an explosion due to SPONTANEOUS decomposition]	Filter/IIb; Methanol, HPLC/UV/D, II(4), [25214]
1597 56					Sp Gr: 1.58 Combustible Solid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	Prevent skin contact	NIOSH	Inh	Itch eyes, nose, head,	Eye:	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	§ SCBAF PD PP/SAF PD, PP ASCBA	Abs	god, con, photo, periorb	Skin:	liver, kidneys,
Wash skin:	When contam	Escape GMFS/SCBAE	Inh	edema dysphonia, aphonia,	Breath:	CNS
Remove:	When wet or contam		Ing	dysphagia, productive	Swallow:	[in animals:
Change:	N.R.		Con	cough, chest pain, dysp		nasal & lung cancer]
Provide:	Eyewash, Quick drench			cyan, vomit, diarr, dysuria, analgesia, fever, album, hema, eye, skin burns, delirium, [canc]	Inmmed: Water flush immed Resp support Medical attention immed	
[Dimethyl sulfate]						
Skin:	Prevent skin contact	TBAL	Inh	Contact eczema;	Eye:	Skin, liver, blood
Eyes:	Prevent eye contact		Abs	in animals: methemo, liver	Skin:	
Wash skin:	When contam		Ing	changes	Breath:	
Remove:	When wet or contam		Con		Swallow:	
Change:	Daily					
[Dinitroimide]						
Skin:	Prevent skin contact	NIOSH/IOSHA	Inh	Anoxia, cyan, vis dist,	Eye:	Eyes, skin, blood,
Eyes:	Prevent eye contact	5 mg/m ³ DM	Abs	central scotomas, bad	Skin:	liver, CVS, CNS
Wash skin:	When contam	10 mg/m ³ DMXSQ/HIE/SA	Ing	taste, burning mouth, dry	Breath:	
Remove:	When wet or contam	25 mg/m ³ SA CF/PAPROM	Con	throat, thirst, yellowing	Swallow:	
Change:	Daily	50 mg/m ³ HIEF/SAT CF/PAPRTHIE/ SCBAF/SAF		hair, eyes, skin, anemia, liver damage		
Provide:	Quick drench	§ SCBAF PD PP/SAF PD, PP ASCBA Escape HIEF/SCBAE				
[o-Dinitrobenzene]						
Skin:	Prevent skin contact	NIOSH/IOSHA	Inh	Anoxia, cyan, vis dist,	Eye:	Eyes, skin, blood,
Eyes:	Prevent eye contact	5 mg/m ³ DM	Abs	central scotomas, bad	Skin:	liver, CVS, CNS
Wash skin:	When contam	10 mg/m ³ DMXSQ/HIE/SA	Ing	taste, burning mouth, dry	Breath:	
Remove:	When wet or contam	25 mg/m ³ SA CF/PAPROM	Con	throat, thirst, yellowing	Swallow:	
Change:	Daily	50 mg/m ³ HIEF/SAT CF/PAPRTHIE/ SCBAF/SAF		hair, eyes, skin, anemia, liver damage		
Provide:	Quick drench	§ SCBAF PD PP/SAF PD, PP ASCBA Escape HIEF/SCBAE				
[m-Dinitrobenzene]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
p-Dinitrobenzene $C_6H_4(NO_2)_2$ 100-25-4 CZ7525000	para-Dinitrobenzene; 1,4-Dinitrobenzene	NIOSH/OSHA 1 mg/m ³ [skin]	50 mg/m ³	Pale white or yellow, crystalline solid.	MW 168.1 BP: 570°F Sol: 0.01% FLP: ? IP: 10.50 eV	VP: ? MLT: 343°F UEL: ? LEL: ?	Strong oxidizers, caustics, metals such as tin & zinc [Note: Prolonged exposure to fire and heat may result in an explosion due to SPONTANEOUS decomposition]	Filter/Bub; Methanol HPLC/UV/D; IR/4) [#5214]
1597 56					Sp Gr: 1.63 Combustible Solid			
Dinitro-o-cresol $CH_3C_6H_3(OH)(NO_2)_2$ 534-52-1 GO9625000	4,6-Dinitro-o-cresol; 3,5-Dinitro-2-hydroxy- toluene; 4,6-Dinitro-2-methyl phenol; DNC; DNOC	NIOSH/OSHA 0.2 mg/m ³ [skin]	5 mg/m ³	Yellow, odorless solid. [insecticide]	MW 198.1 BP: 594°F Sol: 0.01% FLP: NA IP: ?	VP: 0.0005 mm MLT: 190°F UEL: NA LEL: NA MEC: 30 g/m ³	Strong oxidizers	Filter/Bub; 2-Propanol; HPLC/UV/D; IR [#5166]
1598 53					Sp Gr: >1.1 (estimated) Noncombustible Solid			
Dinitrotoluene $C_7H_7(NO_2)_2$ 25321-14-6 XT1300000	Dinitrotoluid; DNT; Methyldinitrobenzene	NIOSH Ca See Appendix A 1.5 mg/m ³ [skin] OSHA 1.5 mg/m ³ [skin]	Ca [50 mg/m ³]	Orange-yellow crystalline solid with a character- istic odor [Note: Often shipped molten]	MW 182.2 BP: 572°F Sol: Insoluble FLP: 404°F IP: ?	VP: 1 mm MLT: 158°F UEL: ? LEL: ?	Strong oxidizers, caustics, metals such as tin & zinc [Note: Commercial grades will decompose at 482°F, with self-sustaining decomposition at 536°F.]	Filter/ Tenax; GC/TEA- EAP; OSHA [#444]
1600 56 (molten) 2038 56 (solid)					Sp Gr: 1.32 Combustible Solid, but difficult to ignite			
Di-sec octyl phthalate $C_{24}H_{38}O_4$ 117-81-7 T10350000	DEHP; Di(2-Ethylhexyl)phthalate; DOP; bis-(2-Ethylhexyl)- phthalate; Octyl phthalate [$C_8H_{17}COOCH_2CH(C_8H_{17})C_8H_{17}$]	NIOSH Ca See Appendix A 5 mg/m ³ ST 10 mg/m ³ OSHA* 5 mg/m ³	Ca [5000 mg/m ³]	Colorless, oily liquid with a slight odor.	MW 390.5 BP: 727°F Sol: 15% 0.00003% FLP (oc): 420°F IP: ?	VP: <0.01 mm FRZ: -58°F UEL: ? LEL (474°F): 0.3%	Nitrates; strong oxidizers, acids & alkalis	Filter; CS; GC/ID; IR [#5020, di(2-Ethyl- hexyl) phthalate]
1 ppm = 16.23 mg/m ³					Sp Gr: 0.99 Class IIIB Combustible Liquid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 6)	
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam Daily Quick drench	NIOSH/OSHA 5 mg/m ³ DM 10 mg/m ³ DMXSQ/HE/SA 25 mg/m ³ SA CF/PAPRDM 50 mg/m ³ HEF/SAT CF/PAPRTHF/ SCBAF/SAF § SCBAF PD/PP/SAF PD/PP ASCBA Escape: HEF/SCBAE	Inh Abs Ing Con	Anoxia, cyan, vis dist, central scotomas, bad taste, burning mouth, dry throat, thirst, yellowing hair, eyes, skin, anemia, liver damage	Eye Skin Breath Swallow immed	Irrimed Soap wash immed Resp support Medical attention immed	Eyes, skin, blood, liver, CVS, CNS
[p-Dinitrobenzene]							
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam/Daily When wet or contam Daily	NIOSH/OSHA 2 mg/m ³ DMF 5 mg/m ³ HEF/SA CF/PAPRDM/ SCBAF/SAF § SCBAF PD/PP/SAF PD/PP ASCBA Escape: HEF/SCBAE	Inh Abs Ing Con	Sense of well being, head, fever, lass, profuse sweat, excess thirst, taccar hyperpnea, cough, short breath, coma	Eye Skin Breath Swallow immed	Irrimed Soap wash immed Resp support Medical attention immed	CVS, endocrine sys
[Dinitro-o-cresol]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam/Daily When wet or contam Daily Quick drench	NIOSH § SCBAF PD/PP/SAF PD/PP ASCBA Escape: GMFOVHE/SCBAE	Inh Abs Ing Con	Anoxia, cyan, anemia, skin, repro effects; [carc]	Eye Skin Breath Swallow immed	Irrimed Soap wash immed Resp support Medical attention immed	Blood, liver, CVS, repro sys [in animals: liver, skin & kidney tumors]
[Dinitrotoluene]							
Skin: Eyes: Wash skin: Remove: Change:	N.R. N.R. N.R. N.R. N.R.	NIOSH § SCBAF PD/PP/SAF PD/PP ASCBA Escape: HEF/SCBAE	Inh Abs Ing Con	Irrit eyes, muc memb, in animals: liver damage; terato effects; [carc]	Eye Breath Swallow immed	Irrimed Resp support Medical attention immed	Eyes, resp sys, CNS, liver, repro sys, GI tract [in animals: liver tumors]
[Di-sec octyl phthalate]							

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Dioxane $C_6H_8O_2$ 123-91-1 JG8225000	Diethylene dioxide; Diethylene ether; Dioxan; p-Dioxane; 1,4-Dioxane	NIOSH Ca See Appendix A C 1 ppm (3.6 mg/m ³) [30-min] OSHA† 100 ppm (360 mg/m ³) [skin]	Ca [500 ppm]	Colorless liquid or solid (below 53°F) with a mild, ether-like odor.	MW: 88.1 BP: 214°F Sol: Miscible FLP: 55°F IP: 9.13 eV	VP: 29 mm FRZ: 53°F UEL: 22% LEL: 2.0%	Strong oxidizers, decaborane, triethylaluminum	Char. CS, GC/FID, IR [#1602]
1165-26	1 ppm = 3.66 mg/m ³				Sp.Gr: 1.03 Class IB Flammable Liquid			
Dioxathion $C_6H_{10}O_2S_2P(OC_2H_5)_2$ 78-34-2 TE3350000	Delnavil; p-Dioxane-2,3-diyl ethyl phosphorodithioate; Dioxane phosphate; 2,3-p-Dioxanethiol S,S-bis- (O,O-diethylphosphoro- dithioate); Navadeth	NIOSH 0.2 mg/m ³ [skin] OSHA† none	N.D.	Viscous, brown, tan, or dark-amber liquid. [insecticide] [Note: Technical product is a mixture of cis- & trans-isomers.]	MW: 456.6 BP: 7 Sol: Insoluble FLP: NA IP: 7	VP: 7 FRZ: -4°F UEL: NA LEL: NA	Alkalies, iron or tin surfaces, heat	None available
1 ppm = 18.98 mg/m ³					Sp.Gr(79°F): 1.26 Noncombustible Liquid			
Diphenyl $C_{12}H_{10}$ 92-52-4 DUB050000	Biphenyl; Phenyl benzene	NIOSH/OSHA 1 mg/m ³ (0.2 ppm)	100 mg/m ³	Colorless to pale- yellow solid with a pleasant, characteristic odor. [fungicide]	MW: 154.2 BP: 489°F Sol: Insoluble FLP: 235°F IP: 7.95 eV	VP: 0.005 mm MLT: 156°F UEL(311°F): 5.0% LEL(232°F): 0.6%	Oxidizers	Tenax GC, CCl, GC/FID, IR [#2530, Biphenyl]
1 ppm = 6.41 mg/m ³					Sp.Gr: 1.04 Combustible Solid			
Diphenylamine $(C_6H_5)_2NH$ 122-39-4 JJ7800000	Anilinobenzene, DPA, Phenylaniline, N-Phenylaniline, N-Phenylbenzenamine [Note: The carcinogen 4-Aminodiphenyl may be present as an impurity in the commercial product.]	NIOSH 10 mg/m ³ OSHA† none	N.D.	Colorless, tan, amber, or brown crystalline solid with a pleasant, floral odor. [fungicide]	MW: 169.2 BP: 578°F Sol: 0.03% FLP: 307°F IP: 7.40 eV	VP(227°F): 5 mm MLT: 127°F UEL: 7 LEL: 7	Oxidizers, hexachloro- melamine, trichloro- melamine	None available
					Sp.Gr: 1.16 Combustible Solid; explosive if a cloud of dust is exposed to a source of ignition.			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet (flamm) N.R. Eyewash, Quick drench	NIOSH M SCBAF PD PP/SAF PD PP ASCBA Escape GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, skin, nose, throat; drow, head nau, vomit, liver damage, kidney failure, [canc]	Eye Skin Breath Swallow Immed Water wash prompt Resp support Medical attention	Eyes, skin, resp sys, liver, kidneys [in animals: lung, liver & nasal cavity tumors]
[Dioxane]						
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R. Eyewash, Quick drench	TBAL	Inh Abs Ing Con	Irrit eyes, skin; head, gidd, vert, weak; rhin, chest tight; miosis; nau, vomit, abdom cramps, diarr, saliv; musc fasc; conf, drow	Eye Skin: Breath: Swallow: Immed Soap flush Immed Resp support Medical attention	Eyes, skin, resp sys, CNS, CVS, blood chol
[Dioxathion]						
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam Daily Eyewash (molt), Quick drench (molt)	NIOSH/OSHA 10 mg/m ³ CCROVDM/SA 25 mg/m ³ SA, CF/PAPROVDM* 50 mg/m ³ CCRFOVHE/GMFOVHE/ PAPRTOVHE/SCBAF/SAF 100 mg/m ³ SAF PD, PP S SCBAF PD PP/SAF PD PP ASCBA Escape GMFOVHE/SCBAE	Inh Abs Ing Con	Irrit eyes, throat, head nau, fig, numb limbs, liver damage	Eye Skin Breath Swallow: Immed Soap wash prompt Resp support Medical attention	Eyes, resp sys, liver, CNS
[Diphenyl]						
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact Daily When wet or contam Daily	TBAL	Inh Abs Ing Con	Irrit eyes, skin, muc memb; eczema; tacer, hypertension; cough, sneez; methemo; incr BP, heart rate; prot, heme, bladder inj; in animals: terato effects	Eye: Skin: Breath: Swallow: Immed Soap wash prompt Resp support Medical attention	Eyes, skin, resp sys, CVS, blood, bladder, repro sys
[Diphenylamine]						

Chemical name, structure formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TLHA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL F.P., IP, Sp. Gr., flammability	VP, FRZ UEL, LEL		
Dipropylene glycol methyl ether <chem>CH3OC2H4OC2H4OH</chem> 34590-94-8 JM1575000	Dipropylene glycol monomethyl ether, Dowanol® 50B 1 ppm = 6.16 mg/m ³	NIOSH 100 ppm (600 mg/m ³) ST 150 ppm (900 mg/m ³) [skin] OSHA† 100 ppm (600 mg/m ³) [skin]	600 ppm	Colorless liquid with a mild ether-like odor.	MW: 148.2 BP: 408°F Sol: Miscible F.P.: 180°F IP: ?	VP: 0.5 mm FRZ: -112°F UEL: 3.0% LEL (392°F): 1.7%	Strong oxidizers	Char; CS; GC/FID; IR[2] [#S69]
Dipropyl ketone <chem>(CH3CH2CH2)2CO</chem> 123-19-3 MJ6600000	Butyrene, DPK, 4-Heptanone, Heptan-4-one, Propyl ketone 1 ppm = 4.75 mg/m ³	NIOSH 50 ppm (235 mg/m ³) OSHA† none	N.D.	Colorless liquid with a pleasant odor.	MW: 114.2 BP: 201°F Sol: Insoluble F.P.: 120°F IP: 9.10 eV	VP: 5 mm FRZ: -27°F UEL: ? LEL: ?	Oxidizers	Char; CS; GC/FID; OSHA [Adapt #7]
2710 26					Sp. Gr: 0.82 Class II Combustible Liquid			
Diquat (Diquat dibromide) <chem>C12H14N4Br2</chem> 88-00-7 JM5930000 2781 85 (solid) 2782 28 (liquid)	Diquat dibromide; 1,1'-Ethylene-2,2'-bipyridylium dibromide [Note: Diquat is a cation (C ₁₂ H ₁₄ N ₄ ²⁺ ; 1,1'-ethylene-2,2'-bipyridylium). Various diquat salts are commercially available.]	NIOSH 0.5 mg/m ³ OSHA† none	N.D.	Dibromide salt: Yellow crystals. [herbicide] [Note: Commercial product may be found in a liquid concentrate or as solution.]	MW: 344.1 BP: Decomposes Sol: 70% F.P.: ? IP: ?	VP: <0.00001 mm MLT: 635°F UEL: ? LEL: ?	Alkalies, UV light, basic solutions [Note: Concentrated diquat solutions corrode aluminum.]	None available
Disulfiram <chem>[C4H4N2S2]2</chem> 87-77-8 JO1225000	Antabuse®, bis[Diethylthiocarbamoyl] disulfide, Ro-Sulfiram®, TETD, Tetraethylthiuram disulfide	NIOSH 2 mg/m ³ [Precautions should be taken to avoid concurrent exposure to ethylene dibromide.] OSHA† none	N.D.	White, yellowish, or light-gray powder with a slight odor, [fungicide]	MW: 296.6 BP: 7° Sol: 0.02% F.P.: NA IP: ?	VP: ? MLT: 158°F UEL: NA LEL: NA	None reported	None available
					Sp. Gr: 1.30 Noncombustible Solid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	N.R.	NIOSH/OSHA 500 ppm: SA/SCBAF § SCBAF PD PP/SAF PD PP ASCBA Escape: GMFOVHE/SCBAE	Inh	Irrit eyes, nose, throat;	Eye	Eyes, resp sys.
Eyes:	N.R.		Abs	weak, it-head, head	Skin	CNS
Wash skin:	N.R.		Inh		Breath:	
Remove:	N.R.		Con		Swallow	
Change:	N.R.					
[Dipropylene glycol methyl ether]						
Skin:	Prevent skin contact	TBAL	Inh	Irrit eyes, skin; CNS	Eye	Eyes, skin, CNS,
Eyes:	Prevent eye contact		Ing	depress, dizz, som, decr	Skin:	liver
Wash skin:	Daily		Con	breath;	Breath:	
Remove:	When wet or contam			in animals: liver inj; narco	Swallow:	
Change:	N.R.					
[Dipropyl ketone]						
Skin:	Prevent skin contact	TBAL	Inh	Irrit eyes, skin, muc memb,	Eye	Eyes, skin, resp sys,
Eyes:	Prevent eye contact		Abs	resp sys; rhin, epis; skin	Skin:	kidneys, liver, CNS
Wash skin:	When contam		Ing	burns; nau, vomit, diar,	Breath:	
Remove:	When wet or contam		Con	mal; kidney, liver inj;	Swallow:	
Change:	Daily			cough, chest pain, dysp;		
Provide:	Quick drench		pulm edema; tremor, convuls; delayed healing of wounds			
[Diquat (Diquat bromide)]						
Skin:	Prevent skin contact	TBAL	Inh	Irrit eyes, skin, resp sys;	Eye	Eyes, skin, resp sys,
Eyes:	Prevent eye contact		Ing	sens derm; lassa, ftg,	Skin:	CNS, PNS, liver
Wash skin:	When contam		Con	tremor, restless, head,	Breath:	
Remove:	When wet or contam			dizz; metallic taste;	Swallow:	
Change:	Daily			perit neur; liver damage		
[Diazinon]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOTID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P., IP, Sp, Gr, Flammability	VP, FRZ UEL, LEL		
Disulfoton $C_4H_{10}O_2PS_2$ 298-04-4 TD9275000	O,O-Diethyl S-2-(ethylthio)-ethyl phosphorodithioate; Di-Syston®; Thiodemeton [(C_2H_5O) ₂ P(S)(SC_2H_5) _{2]}	NIOSH 0.1 mg/m ³ [skin] OSHA† none	N.D.	Oil, colorless to yellow liquid with a characteristic, sulfur odor. [Note: Technical product is a brown liquid.]	MW: 274.4 BP: ? Sol(73°F): 0.003% Fl.P: >180°F IP: ?	VP: 0.0002 mm FRZ: >-13°F UEL: ? LEL: ?	Alkalis	None available
2783 55	1ppm=11.41 mg/m ³				Sp. Gr: 1.14 Combustible Liquid, but will not ignite easily.			
2,6-Di-tert-butyl-p-cresol [$C(CH_3)_3$] ₂ CH ₃ C ₆ H ₃ OH 129-37-0 GO7875000	BHT; Butylated hydroxytoluene; Dibutylated hydroxytoluene; 4-Methyl-2,6-di-tert-butyl phenol	NIOSH 10 mg/m ³ OSHA† none	N.D.	White to pale-yellow, crystalline solid with a slight, phenolic odor. [Food preservative]	MW: 220.4 BP: 503°F Sol: 0.00004% Fl.P: 261°F IP: ?	VP: 0.01 mm MLT: 158°F UEL: ? LEL: ?	Oxidizers	Sigal; Methanol/ CS; GC/FID; N/I [P&CAM #226]
					Sp. Gr: 1.05 Class IIIB Combustible Liquid			
Duron $C_6H_4Cl_2NHCON(CH_3)_2$ 330-54-1 YS8925000	3-(3,4-Dichlorophenyl)-1,1-dimethylurea; Durex®; Karnas®	NIOSH 10 mg/m ³ OSHA† none	N.D.	White, odorless, crystalline solid. [herbicide]	MW: 233.1 BP: 356°F (Decomposes) Sol: 0.004% Fl.P: NA IP: ?	VP: 0.000000002 mm MLT: 316°F UEL: NA LEL: NA	Strong acids	Filter; none; Grav; III [#0500 Nuisance Dust (total)]
					Sp Gr ? Noncombustible Liquid			
Divinyl benzene $C_6H_4(CH=CH_2)_2$ 1321-74-0 (mixed isomers) CZ9370000	Diethyl benzene, DVB, Vinylstyrene [Note: Commercial product contains all 3 isomers, but m-isomer predominates. Usually contains an inhibitor to prevent polymerization.] 1ppm = 5.41 mg/m ³	NIOSH 10 ppm (50 mg/m ³) OSHA† none	N.D.	Pale, straw-colored liquid.	MW: 130.2 BP: 38.2°F Sol: 0.005% Fl (oc): 169°F IP: ?	VP: 0.7 mm FRZ: -48°F UEL: 6.2% LEL: 1.1%	None reported	Char; Toluene; GC/FID; OSHA [#89]
					Sp. Gr: 0.93 Class IIA Combustible Liquid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)		Target organs (See Table 5)
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam Daily Eyewash, Quick drench	TBAL	Inh Abs Inj Con	Irrit eyes, skin; nau, vomit, abdom cramps, diar, saliv; head, gidd, verti, weak; rhin, chest tight; blurred vision, moses; card irreg, musc fasc; dysp, eye, skin burns	Eye: Skin: Breath: Swallow:	Irr immed Soap flush immed Resp support Medical attention immed	Eyes, skin, resp sys, CNS, CVS, blood chol
[Disulfoton]							
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet or contam Daily	TBAL	Inh Inj Con	Irrit eyes, skin; in animals: decr growth rate, incr liver weight	Eye: Skin: Breath: Swallow:	Irr immed Soap wash Fresh air Medical attention immed	Eyes, skin
[2,6-Di-tert-butyl-p-cresol]							
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact Daily N.R. Daily	TBAL	Inh Inj Con	Irrit eyes, skin, nose, throat; in animals: anemia, methemo	Eye: Skin: Breath: Swallow:	Irr immed Water flush immed Resp support Medical attention immed	Eyes, skin, resp sys, blood
[Duron]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam N.R. Eyewash, Quick drench	TBAL	Inh Inj Con	Irrit eyes, skin, resp sys; skin burns; in animals: CNS depres	Eye: Skin: Breath: Swallow:	Irr immed Soap flush immed Resp support Medical attention immed	Eyes, skin, resp sys, CNS
[Divinyl benzene]							

Chemical name, structure formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl P, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
1-Dodecanethiol <chem>CH3(CH2)11SH</chem> 112-55-0 JR3155000	Dodecyl mercaptan, 1-Dodecyl mercaptan, n-Dodecyl mercaptan, Lauryl mercaptan, n-Lauryl mercaptan, 1-Mercaptododecane	NIOSH C 0.5 ppm (4.1 mg/m ³) [15-min] OSHA none	N.D.	Colorless, water- white, or pale- yellow, oily liquid with a mild, skunk- like odor. [Note: A solid below 15°F.]	MW: 202.4 BP: 441-478°F Sol: Insoluble Fl P (oc): 190°F IP: ?	VP (77°F): 3 mm FRZ: 15°F UEL: ? LEL: ?	Strong oxidizers & acids, strong bases, reducing agents, alkali metals, water, steam	None available
1 ppm = 8.41 mg/m ³					Sp. Gr: 0.85 Class IIIA Combustible Liquid			
Emery <chem>Al2O3</chem> 12415-34-8 (emery) 1302-74-5 (corundum) JY3000000 (emery) GN0231000 (corundum)	Aluminum oxide, Aluminum trioxide, Corundum, Impure corundum, Natural aluminum oxide [Note: Emery is an impure variety of Al ₂ O ₃ which may contain small impurities of iron, magnesium & silica. Corundum is natural Al ₂ O ₃ .]	NIOSH See Appendix D OSHA† 15 mg/m ³ (total) 5 mg/m ³ (resp)	N.D.	Odorless, white, crystalline powder.	See α-Alumina for physical & chemical properties.		Filter; none; Grav; III [Nuisance Dust: #0500 (total), #0600 (resp)]	
Endosulfan <chem>C8H8Cl2O6S</chem> 115-29-7 RB9275000	Benodanil; Endosulphan; 6,7,8,9,10-Hexachloro- 1,5,6a,6,9a-hexahydro- 6,9-methano-2,4,3-benzo- dioxathiepin-3-oxide; Thiodan®	NIOSH 0.1 mg/m ³ [skin] OSHA† none	N.D.	Brown crystals with a slight sulfur dioxide odor, [insecticide] [Note: Technical product is a tan, waxy, isomer mixture.]	MW: 406.9 BP: Decomposes Sol: 0.00001% Fl P: NA IP: ? Sp. Gr: 1.74 Noncombustible Solid, but may be dissolved in flammable liquids.	VP (77°F): 0.00001 mm MLT: 223°F UEL: NA LEL: NA	Alkalis, acids, water [Note: Corrosive to iron. Hydrolyzes slowly on contact with water or decomposes in presence of alkalis and acids to form sulfur dioxide.]	None available
2761 55								
Endrin <chem>C12H8Cl4O</chem> 72-20-8 ID1575000	1,2,3,4,10,10-Hexachloro- 6,7-epoxy- 1,4,4a,5,6,7,9,9a- octahydro-1,4:endo- 5,8-dimethanonaphthalene Hexadrin®	NIOSH/OSHA 0.1 mg/m ³ [skin]	2 mg/m ³	Colorless to tan crystalline solid with a mild chemical odor [insecticide]	MW: 380.9 BP: Decomposes Sol: Insoluble Fl P: NA IP: ? Sp. Gr: 1.70 Noncombustible Solid, but may be dissolved in flammable liquids.	VP: Low MLT: 392°F (Decomposes) UEL: NA LEL: NA	Strong oxidizers strong acids perchloric [Note: May emit hydrogen chloride & phosgene when heated or burned.]	Filter/ Chrom-102 Toluene GC-ECD III [#5519]
2761 55								

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 6)	First aid (See Table 6)	Target organs (See Table 6)
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R. Provide: Eyewash		NIOSH 6 ppm: GCROV/SA 12.5 ppm: SA:CF/PAPROV 25 ppm: GCRFOV/GMFOV/PAPRTOV/ SCBAF/SAF § SCBAF:PD,PP:SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, skin, resp sys; cough; dizz, dysp, weak, conf, cyan; abdom pain, nau; skin sens	Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed	Eyes, skin, resp sys, CNS, blood
[1-Dodecanethiol]						
Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R. Provide:		TBAL	Inh Ing Con	Irrit eyes, skin, resp sys	Eye: Fresh air Breath: Swallow; Swallow: Medical attention immed	Eyes, skin, resp sys
[Emery]						
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily Provide: Eyewash, Quick drench		TBAL	Inh Abs Ing Con	Irrit skin; nau, conf, agitation, flushing, dry mouth, tremor, convuls, head; In animals: kidney, liver ing; decr testis weight	Eye: Irr immed Skin: Soap flush immed Breath: Resp support Swallow: Medical attention immed	Skin, CNS, liver, kidneys, repro sys
[Endosulfan]						
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily Provide: Eyewash, Quick drench		NIOSH/OSHA 1 mg/m ³ : CCROVDMFu/SA 2 mg/m ³ : SA:CF/PAPROVDMFu/ CCRFOVHE/GMFOVHE/ SCBAF/SAF § SCBAF:PD,PP:SAF:PD,PP:ASCBA Escape: GMFOVHE/SCBAE	Inh Abs Ing Con	Epilep convuls, stupor, head, dizz, abdom discomfort, nau, vomit; insect: aggressiveness, conf, leth, weak, anor; in animals: liver damage	Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed	CNS, liver
[Endrin]						

Chemical name, structure/formula, CAS and RTE/CS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TLV unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL, FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Ethrane CHF ₃ , OCF ₂ , CHClF 13838-16-9 KN6800000	2-Chloro-1-(difluoro- methoxy)-1,1,2-trifluoro- ethane; 2-Chloro-1,1,2-trifluoro- ethyl difluoromethyl ether; Ethrane®	NIOSH C 2 ppm (15.1 mg/m³) [60-min] [Note: REL for exposure to waste anesthetic gas.]	N.D.	Clear, colorless liquid with a mild, sweet odor. [Inhalation anesthetic]	MW: 184.5 BP: 134°F Sol: Low FLP: NA IP: ?	VP: 175 mm FRZ: 7 UEL: NA LEL: NA	None reported	Char(2); CS; GCFID; OSHA [§29]
	1 ppm = 7.67 mg/m³	OSHA none			Sp.Gr(77°F): 1.52 Noncombustible Liquid			
Epichlorohydrin C ₃ H ₅ ClO 106-89-8 TX4900000	1-Chloro-2,3-epoxypropane; 2-Chloropropylene oxide; gamma-Chloropropylene oxide	NIOSH Ca See Appendix A OSHA† 5 ppm (19 mg/m³) [skin]	Ca [75 ppm]	Colorless liquid with a slightly irritating, chloroform-like odor.	MW: 92.5 BP: 242°F Sol: 7% FLP: 93°F IP: 10.60 eV	VP: 13 mm FRZ: -54°F UEL: 21.0% LEL: 3.8%	Strong oxidizers, strong acids, certain salts, caustics, zinc, aluminum, water [Note: May polymerize in presence of strong acids and bases, particularly when hot.]	Char; CS; GCFID; II [§1010]
2023 30 EPN C ₁₂ H ₁₁ O ₃ NP 2104-64-5 TB1925000	Ethyl p-nitrophenyl benzenesulfonophosphate, O-Ethyl O-(4-nitrophenyl) phenylphosphonothioate [C ₁₂ H ₁₁ O ₃ (C ₆ H ₄)P(S)(OC ₂ H ₅)NO ₂]	NIOSH/OSHA 0.5 mg/m³ [skin]	5 mg/m³	Yellow solid with an aromatic odor (pesticide) [Note: A brown liquid above 97°F.]	MW: 323.3 BP: ? Sol: Insoluble FLP: NA IP: ?	VP(212°F): 0.0003 mm M.L.T. 97°F UEL: NA LEL: NA	Strong oxidizers	Filter; Isocodane; GC/FPD; II [§5012]
	1 ppm = 3.85 mg/m³				Sp.Gr(77°F): 1.27 Noncombustible Solid			
Ethanolamine NH ₂ CH ₂ CH ₂ OH 141-43-5 KJ5775000	2-Aminoethanol, 2-Aminoethyl alcohol, Ethanolamine, 2-Hydroxyethylamine, Monoethanolamine	NIOSH 3 ppm (8 mg/m³) ST 6 ppm (15 mg/m³) OSHA† 3 ppm (6 mg/m³)	30 ppm	Colorless, viscous liquid or solid (below 51°F) with an unpleasant, ammonia-like odor.	MW: 61.1 BP: 339°F Sol: Miscible FLP: 186°F IP: 8.96 eV	VP: 0.4 mm FRZ: 51°F UEL: 23.6% LEL(284°F): 3.0%	Strong oxidizers, strong acids, iron [Note: May attack copper, brass, and rubber.]	Si gel; Methanol/ Water; GC/FPD; II [§2007, Amino- ethanol Compounds]
2491 60	1 ppm = 2.54 mg/m³				Sp.Gr 1.02 Class IIA Combustible Liquid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 6)
Skin:	N.R.	TBAL	Inh	Irrit eyes; CNS depres,	Eye:	Eyes, CNS
Eyes:	Prevent eye contact		Ing	analgesia, anes, sez,	Skin:	
Wash skin:	N.R.		Con	resp depres	Breath:	
Remove:	N.R.				Swallow:	
Change:	N.R.					
[Erlutane]						
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, skin with deep	Eye	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	§ SCBAF PD PP/SAF PD PP ASCBA	Abs	pain, nau, vomit, abdom	Skin	kidneys, liver,
Wash skin:	When contam	Escape GMFOVAG/SCBAE	Ing	pain, resp distress, cough,	Breath	repro sys
Remove:	When wet (flammi)		Con	cyan, repro effects; [carc]	Swallow	(In animals: nasal cancer)
Change:	N.R.					
Provide:	Eyewash, Quick drench					
[Epichlorohydrin]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin, miosis,	Eye	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	§ mg/m ³ : SA/SCBAF	Abs	lac, rin, head, chest	Skin	CVS, CNS, blood chol
Wash skin:	When contam	§ SCBAF PD PP/SAF PD PP ASCBA	Ing	tight, wheez, lar spasm;	Breath	
Remove:	When wet or contam	Escape GMFOVH/SCBAE	Con	salv, cyan, anox, nau,	Swallow	
Change:	Daily			abdom cramps, diarr, para,		
Provide:	Eyewash, Quick drench			convuls, low BP, card irreg		
[EPN]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin, resp	Eye	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	30 ppm: CCRS*/GMFS/PAPRS*/SA*/	Ing	sys, leth	Skin	CNS
Wash skin:	When contam	SCBAF	Con		Breath	
Remove:	When wet or contam	§ SCBAF PD PP/SAF PD PP ASCBA			Swallow:	
Change:	Daily	Escape GMFS/SCBAE				
Provide:	Eyewash					
[Ethanolamine]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Ethion [(C ₂ H ₅ O) ₂ P(S)(S) ₂ CH ₃] 563-12-2 TE4550000	O,O,O',O'-Tetraethyl S,S'- methylene di(phosphoro- dithioate)	NIOSH 0.4 mg/m ³ [skin] OSHA† none	N.D.	Colorless to amber- colored, odorless liquid. [Insecticide] [Note: A solid below 10°F. The techni- cal product has a very disagreeable odor.]	MW: 384.5 BP: >302°F (Decomposes) Sol: 0.0001% FLP: 149°F IP: ? Sp Gr: 1.22 Class III B Combustible Liquid	VP: 0.0000015 mm FRZ: 10°F UEL: ? LEL: ?	Acids, alkalis	None available
2783 55 2-Ethoxyethanol C ₂ H ₅ OCH ₂ CH ₂ OH 110-80-5 KK8050000	Cellulosolve®; EGEE, Ethylene glycol monoethyl ether	NIOSH 0.5 ppm (1.8 mg/m ³) [skin] OSHA 200 ppm (740 mg/m ³) [skin]	500 ppm	Colorless liquid with a sweet, pleasant, ether- like odor.	MW 90.1 BP: 275°F Sol: Miscible FLP 110°F IP: ? Sp Gr: 0.93 Class II Combustible Liquid	VP: 4 mm FRZ: -130°F UEL(200°F): 15.0% LEL(200°F): 1.7%	Strong oxidizers	Char; CH ₃ Cl, Methanol, GC/FID, IR [#1403, Alcohols IV]
1171 26 2-Ethoxyethyl acetate CH ₃ COOCH ₂ CH ₂ OC ₂ H ₅ 111-15-9 KK8225000	Cellulosolve® acetate, EGEEA, Ethylene glycol monoethyl ether acetate, Glycol monoethyl ether acetate	NIOSH 0.5 ppm (2.7 mg/m ³) [skin] OSHA 100 ppm (540 mg/m ³) [skin]	500 ppm	Colorless liquid with a mild odor.	MW 132.2 BP 313°F Sol: 23% FLP 124°F IP: ? Sp Gr: 0.98 Class II Combustible Liquid	VP: 2 mm FRZ: -79°F UEL: ? LEL 1.7%	Nitrates, strong oxidizers, alkalis & acids	Char; CS, GC/FID, IR [#1450, Esters I]
1172 26 Ethyl acetate CH ₃ COOC ₂ H ₅ 141-78-6 AH5425000	Acetic ester, Acetic ether, Ethyl ester of acetic acid, Ethyl ethanoate	NIOSH/OSHA 400 ppm (1400 mg/m ³)	2000 ppm [LEL]	Colorless liquid with an ether- like, fruity odor.	MW 88.1 BP 171°F Sol(77°F): 10% FLP 24°F IP: 10.01 eV Sp Gr: 0.90 Class IB Flammable Liquid	VP: 73 mm FRZ: -117°F UEL 11.5% LEL 2.0%	Nitrates, strong oxidizers, alkalis & acids	Char; CS, GC/FID, IR [#549]
1173 26	1 ppm = 3.66 mg/m ³							

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam Daily Eyewash, Quick drench	TBAL	Inh Abs Ing Con	Irrit eyes, skin; nau, vomit, abdom cramps, diarr, saliv; head, gidd, verti; weak: rhin, chest tight; blurred vision, miosis; card irreg; musc fasc; dysp	Eye: Skin: Breath: Swallow: Immed Soap wash immed Resp support Medical attention Immed	Eyes, skin, resp sys, CNS, CVS, blood chol
[Ethion]						
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R.	NIOSH 5 ppm: SA* 12.5 ppm: SA-CF* 25 ppm: SCBAF/SAF 500 ppm: SA, PD, PP* §: SCBAF, PD, PP/SAF, PD, PP: ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	In animals: irrit eyes resp sys; blood changes liver, kidney, lung damage, repro, terato effects	Eye Skin Breath Swallow Immed Water flush prompt Resp support Medical attention Immed	Eyes, resp sys, blood, kidneys liver, repro sys, hemato sys
[2-Ethoxyethanol]						
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R.	NIOSH 5 ppm: CCROV*/SA* 12.5 ppm: SA, CF*/PAPROV* 25 ppm: CCROV/GMFOV/PAPROV*/ SCBAF/SAF 500 ppm: SA, PD, PP* §: SCBAF, PD, PP/SAF, PD, PP: ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, nose, vomit, kidney damage, para In animals: repro, terato effects	Eye Skin Breath Swallow Immed Water flush prompt Resp support Medical attention Immed	Eyes, resp sys, GI tract, repro sys, hemato sys
[2-Ethoxyethyl acetate]						
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet (flammi) N.R.	NIOSH/OSHA 2000 ppm: SA, CF*/PAPROV*/CCROFOW/ GMFOV/SCBAF/SAF §: SCBAF, PD, PP/SAF, PD, PP: ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, skin, nose, throat, narco, derm	Eye Skin Breath Swallow Immed Water flush prompt Resp support Medical attention Immed	Eyes, skin, resp sys
[Ethyl acetate]						

Chemical name, structure/formula, CAS and RTECS No., and DOT ID and guide No.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P., IP, Sp. Gr., flammability	VP, FRZ UEL, LEL		
Ethyl acrylate $\text{CH}_2=\text{CHCOOC}_2\text{H}_5$ 140-88-5 AT0700000	Ethyl acrylate (inhibited) Ethyl ester of acrylic acid. Ethyl propenoate	NIOSH Ca See Appendix A OSHA† 25 ppm (100 mg/m³) [skin]	Ca [300 ppm]	Colorless liquid with an acrid odor.	MW 100.1 BP 211°F Sol. 2% Fl.P. 48°F IP: 10.30 eV	VP 29 mm FRZ -90°F UEL 14% LEL 14%	Oxidizers, peroxides, polymerizers, strong alkalis, moisture, chlorosulfonic acid [Note: Polymerizes readily unless an inhibitor such as hydroquinone is added.]	Char. CS, GC/FID III [#1450, Esters I]
1917 27 (inhibited)	1 ppm = 4.16 mg/m³				Sp. Gr. 0.92 Class IB Flammable Liquid			
Ethyl alcohol $\text{CH}_3\text{CH}_2\text{OH}$ 64-17-5 K06300000	Alcohol, Cologne spirit, Ethanol, EtOH, Grain alcohol	NIOSH/OSHA 1000 ppm (1800 mg/m³)	3300 ppm [LEL]	Clear, colorless liquid with a weak, ethereal, vinous odor.	MW 46.1 BP: 173°F Sol: Miscible Fl.P. 55°F IP: 9.51 eV	VP 44 mm FRZ: -114°F UEL: 19% LEL: 3.3%	Strong oxidizers, potassium dichromate, bromine pentafluoride, acetyl bromide, acetyl chloride, platinum, sodium	Char. 2-Butanol/ CS, GC/FID; III [#1400, Alcohols I]
1170 26	1 ppm = 1.92 mg/m³				Sp. Gr. 0.79 Class IB Flammable Liquid			
Ethylamine $\text{CH}_3\text{CH}_2\text{NH}_2$ 75-04-7 KH2100000	Aminoethane. Ethylamine (anhydrous), Monethylamine	NIOSH/OSHA 10 ppm (18 mg/m³)	600 ppm	Colorless gas or water-white liquid (below 62°F) with an ammonia-like odor [Note: Shipped as a liquefied compressed gas.]	MW 45.1 BP 62°F Sol. Miscible Fl.P. 17°F IP 8.86 eV RGSD-1.61 Sp. Gr. 0.69 (Liquid) Flammable Gas Class IA Flammable Liquid	VP 874 mm FRZ -114°F UEL 14.0% LEL 3.5%	Strong acids, strong oxidizers, copper, tin & zinc in presence of moisture, cellulose, nitrate, chlorine, hypochlorites	Sigal H ₂ SO ₄ GC/FID, III [#144]
1036 68	1 ppm = 1.87 mg/m³							
Ethyl benzene $\text{CH}_3\text{CH}_2\text{C}_6\text{H}_5$ 100-41-4 OA0700000	Ethylbenzol, Phenylethane	NIOSH 100 ppm (425 mg/m³) ST 125 ppm (545 mg/m³) OSHA† 100 ppm (436 mg/m³)	800 ppm	Colorless liquid with an aromatic odor	MW 106.2 BP 277°F Sol 0.01% Fl.P. 55°F IP 8.76 eV	VP 7 mm FRZ -139°F UEL 6.7% LEL 0.8%	Strong oxidizers	Char., CS, GC/FID, III [#1501 Aromatic Hydro- carbons]
1175 26	1 ppm = 4.41 mg/m³				Sp. Gr. 0.87 Class IB Flammable Liquid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, skin, resp sys;	Eye:	Eyes, skin, resp sys
Eyes:	Prevent eye contact	W: SCBAF; PD, PP/SAF; PD, PP, ASCBA	Abs	[carc]	Skin:	[in animals: tumors of the
Wash skin:	When contam	Escape: GMFOV/SCBAE	Inh		Breath:	forestomach]
Remove:	When wet (flamm)		Ing		Swallow:	
Change:	N.R.		Con			
Provide:	Eyewash, Quick drench					
[Ethyl acrylate]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin, nose;	Eye:	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	3300 ppm: SA/SCBAF	Abs	head, drow, flg, narco;	Skin:	CNS, liver, blood,
Wash skin:	When contam	§: SCBAF; PD, PP/SAF; PD, PP, ASCBA	Ing	cough; liver damage;	Breath:	repro sys
Remove:	When wet (flamm)	Escape: SCBAE	Con	anemia; repro, terato effects	Swallow:	
Change:	N.R.					
[Ethyl alcohol]						
Skin:	Prevent skin contact (liq)	NIOSH/OSHA	Inh	Irrit eyes, skin, resp	Eye:	Eyes, skin, resp sys
Eyes:	Prevent eye contact (liq)	250 ppm: SA, CF ¹ /PAPRS ¹	Abs	sys, skin burns, derm	Skin:	
Wash skin:	When contam (liq)	500 ppm: CCRFS/GMFS/SCBAF/SAF	(liq)			
Remove:	When wet or contam (liq)	600 ppm: SAF; PD, PP	Ing		Breath:	
Change:	N.R.	§: SCBAF; PD, PP/SAF; PD, PP, ASCBA	(liq)		Swallow:	
Provide:	Eyewash (liq), Quick drench (liq)	Escape: GMFS/SCBAE	Con			
[Ethylamine]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin, muc memb;	Eye:	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	800 ppm: CCROV ¹ /GMFOV/PAPROV ¹ /	Ing	head, derm, narco, coma	Skin:	CNS
Wash skin:	When contam	SA ¹ /SCBAF	Con		Breath:	
Remove:	When wet (flamm)	§: SCBAF; PD, PP/SAF; PD, PP, ASCBA			Swallow:	
Change:	N.R.	Escape: GMFOV/SCBAE				
[Ethyl benzene]						

Chemical name, structure formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Ethyl bromide <chem>CH3CH2Br</chem> 74-96-4 KH6475000	Bromoethane, Monobromoethane	NIOSH See Appendix D OSHA† 200 ppm (890 mg/m³)	2000 ppm	Colorless to yellow liquid with an ether-like odor. [Note: A gas above 101°F.]	MW 109.0 BP 101°F Sol 0.9% Fl.P +4°F IP 10.29 eV	VP 375 mm FRZ -182°F UEL 8.0% LEL 6.8%	Chemically active metals such as sodium, potassium, calcium, powdered aluminum, zinc & magnesium	Char; 2-Propanol/ GC/FID; II [#1011]
1891 58	1 ppm = 4.53 mg/m³				Sp Gr 1.46 Class IB Flammable Liquid			
Ethyl butyl ketone <chem>CH3CH2CO(CH2)3CH3</chem> 106-35-4 MJ5250000	Butyl ethyl ketone, 3-Heptanone	NIOSH/OSHA 50 ppm (230 mg/m³)	1000 ppm	Colorless liquid with a powerful, fruity odor.	MW 114.2 BP 206°F Sol 1% Fl (Proc) 115°F IP 9.02 eV	VP 4 mm FRZ -38°F UEL ? LEL ?	Oxidizers, acetaldehyde, perchloric acid	Char; Methanol/ CS, GC/FID; II [#1301, Ketones II]
	1 ppm = 4.75 mg/m³				Sp Gr 0.82 Class II Combustible Liquid			
Ethyl chloride <chem>CH3CH2Cl</chem> 75-00-3 KH7525000	Chloroethane, Hydrochloric ether, Monochloroethane, Muriatic ether	NIOSH Handle with caution in the workplace. See Appendix C (Chloroethanes) OSHA 1000 ppm (2600 mg/m³)	3800 ppm [LEL]	Colorless gas or liquid (below 54°F) with a pungent, ether- like odor. [Note: Shipped as a liquefied compressed gas.]	MW 64.5 BP 54°F Sol 0.6% Fl.P NA (Gas) -58°F (Liq) IP 10.97 eV RGasD: 2.23 Sp Gr 0.92 (Liquid at 32°F) Flammable Gas Class IA Flammable Liquid	VP 1000 mm FRZ -218°F UEL 15.4% LEL 3.8%	Chemically active, metals such as sodium, potassium, calcium, powdered aluminum, zinc & magnesium, oxidizers, water or steam [Note: Reacts with water to form hydrochloric acid.]	Char(2); CS, GC/FID; II [#2519]
1037 27	1 ppm = 2.68 mg/m³							
Ethylene chlorohydrin <chem>CH2ClCH2OH</chem> 107-07-3 KK0875000	2-Chloroethanol, 2-Chloroethyl alcohol, Ethylene chlorohydrin	NIOSH C 1 ppm (3 mg/m³) [skin] OSHA† 5 ppm (16 mg/m³) [skin]	7 ppm	Colorless liquid with a faint, ether-like odor	MW 80.5 BP 202°F Sol Miscible Fl.P 140°F IP 10.90 eV	VP 5 mm FRZ -90°F UEL 15.9% LEL 4.9%	Strong oxidizers, strong caustics, water or steam	Char(pet); 2-Propanol/ CS, GC/FID; II [#2513]
1135 55	1 ppm = 3.35 mg/m³				Sp Gr 1.20 Class IIIA Combustible Liquid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection – maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 8)
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flamms) Change: N.R.		OSHA 2000 ppm: SA/SCBAF § SCBAF PD, PP/SAF PD, PP ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, skin, resp sys, CNS depres, pulm edema, liver, kidney disease, card arry, card arrest	Eye: Skin: Breath: Swallow: Irrimed Soap flush prompt Resp support Medical attention immed	Eyes, skin, resp sys, liver, kidneys, CVS, CNS
[Ethyl bromide]						
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R.		NIOSH/OSHA 500 ppm: CCROV/SA* 1000 ppm: SA:CF*/PAPROV*/CCRFOV/ GMFOV/SCBAF/SAF § SCBAF PD, PP/SAF PD, PP ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, skin, muc memb, head, narco, coma, derm	Eye: Skin: Breath: Swallow: Irrimed Water flush Resp support Medical attention immed	Eyes, skin, resp sys, CNS
[Ethyl butyl ketone]						
Skin: Prevent skin contact (liq) Eyes: Prevent eye contact (liq) Wash skin: N.R. Remove: When wet (flamms) Change: N.R.		OSHA 3600 ppm: SA*/SCBAF § SCBAF PD, PP/SAF PD, PP ASCBA Escape: GMFOV/SCBAE	Inh Abs (liq) Ing (liq) Con	Inco, inebri, abdom cramps, card arry, card arrest, liver, kidney damage	Eye: Skin: Breath: Swallow: Irrimed (liq) Water flush prompt (liq) Resp support Medical attention immed (liq)	Liver, kidneys, resp sys, CVS, CNS
[Ethyl chloride]						
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R. Provide: Eyewash, Quick drench		NIOSH 7 ppm: SA*/SCBAF § SCBAF PD, PP/SAF PD, PP ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irrit muc memb, nau, vomt, vert, inco, numb, vs dist, head, thirst, delirium, low BP, collapse, shock, coma, liver, kidney damage	Eye: Skin: Breath: Swallow: Irrimed Water flush immed Resp support Medical attention immed	Resp sys, liver, kidneys, CNS, CVS, eyes
[Ethylene dichlorohydrin]						

Chemical name, structural formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL F.P., IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Ethylenediamine <chem>NH2CH2CH2NH2</chem> 107-15-3 KH8575000	1,2-Diaminoethane, 1,2-Ethanediamine, Ethylenediamine (anhydrous)	NIOSH/OSHA 10 ppm (25 mg/m ³)	1000 ppm	Colorless, viscous liquid with an ammonia-like odor (fungicide) [Note: A solid below 47°F]	MW 60.1 BP 241°F Sol: Miscible F.P. 33°F IP: 8-60 eV	VP: 11 mm FRZ: 47°F UEL (212°F): 12% LEL (212°F): 2.5%	Strong acids & oxidizers; carbon tetrachloride & other chlorinated organic compounds; carbon disulfide [Note: Corrosive to metals.]	XAD-2*, DMF, HPLC/UV/D, II [#2540]
1804-29	1 ppm = 2.50 mg/m ³				Sp Gr: 0.91 Class IC Flammable Liquid			
Ethylene dibromide <chem>BrCH2CH2Br</chem> 106-93-4 KH9275000	1,2-Dibromoethane, Ethylene bromide, Glycol dibromide	NIOSH Ca See Appendix A 0.045 ppm C: 0.13 ppm [15-min] OSHA 20 ppm C: 30 ppm 50 ppm [5-min max peak]	Ca [100 ppm]	Colorless liquid with a pleasant, 50°F) with a sweet odor [Fungicide]	MW 187.3 BP: 268°F Sol: 0.4% F.P. NA IP: 9.45 eV	VP: 12 mm FRZ: 50°F UEL: NA LEL: NA	Chemically-active metals such as sodium, potassium, calcium, hot aluminum & magnesium; liquid ammonia; strong oxidizers	Char, Benzene/ Methanol; GC/EC/D, III [#1008]
1605-55	1 ppm = 7.81 mg/m ³				Sp Gr: 2.17 Noncombustible Liquid			
Ethylene dichloride <chem>ClCH2CH2Cl</chem> 107-06-2 KH0525000	1,2-Dichloroethane, Ethylene chloride, Glycol dichloride	NIOSH Ca See Appendix A, C (Chloroethanes) 1 ppm (4 mg/m ³) ST 2 ppm (8 mg/m ³) OSHA† 80 ppm C: 100 ppm 200 ppm (5-min max peak in any 3 hrs)	Ca [60 ppm]	Colorless liquid with a pleasant, chloroform-like odor [Note: Decomposes slowly, becomes acidic & darkens in color.]	MW 99.0 BP: 182°F Sol: 0.9% F.P. 56°F IP: 11.05 eV	VP: 64 mm FRZ: -32°F UEL: 16% LEL: 6.2%	Strong oxidizers & caustics; chemically-active metals such as sodium, potassium, aluminum powder, sodium & potassium; liquid ammonia [Note: Decomposes to vinyl chloride & HCl above 1112°F.]	Char, CS, GC/FID; III [#1003, Halogenated Hydrocarbons]
1184-26	1 ppm = 4.11 mg/m ³				Sp Gr: 1.24 Class IB Flammable Liquid			
Ethylene glycol <chem>HOCH2CH2OH</chem> 107-21-1 KW2975000	1,2-Dihydroxyethane; 1,2-Ethanediol; Glycol; Glycol alcohol; Monoethylene glycol	NIOSH See Appendix D OSHA† none	N.D.	Clear, colorless, viscous, odorless liquid [antifreeze] [Note: A solid below 9°F.]	MW: 62.1 BP: 388°F Sol: Miscible F.P.: 232°F IP: 7	VP: 0.06 mm FRZ: 9°F UEL: 15.3% LEL: 3.2%	Strong oxidizers, chromium trioxide, potassium permanganate, 2-Propanol/water; [Note: Hygroscopic (i.e., absorbs moisture from the air).]	Filter/ Si gel; GC/FID; II [#5500]
	1 ppm = 2.58 mg/m ³				Sp Gr: 1.11 Class IIB Combustible Liquid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam/Daily When wet (flam) Daily Eyewash (>6%), Quick drench	NIOSH/OSHA 250 ppm SA CF/PAPRS ¹ 500 ppm CCRFS/GMFS/PAPRS ² / SCBAF/SAF 1000 ppm: SAF/PD,PP § SCBAF PD PP/SAF PD,PP ASCBA Escape GMFS/SCBAE	Inh Abs Ing Con	Irrit nose, resp sys, sens derm asthma, liver, kidney damage	Eye: Skin: Breath: Swallow: Irrigated Water flush Respiratory support Medical attention immed	Skin, resp sys, liver, kidneys
[Ethylenediamine]						
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R. Eyewash, Quick drench	NIOSH § SCBAF PD PP/SAF PD,PP ASCBA Escape GMFOV/SCBAE	Inh Abs Ing Con	Irr eyes, skin, resp sys, derm with vesic, liver, heart, spleen, kidney damage; repro effects; [canc]	Eye: Skin: Breath: Swallow: Irrigated Soap wash Respiratory support Medical attention immed	Eyes, skin, resp sys, liver, kidneys, repro sys [in animals: skin & lung tumors]
[Ethylene dibromide]						
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet (flam) N.R. Eyewash, Quick drench	NIOSH § SCBAF PD,PP/SAF PD,PP ASCBA Escape GMFOV/SCBAE	Inh Abs Ing Con	Irr eyes, corneal opac; CNS depress, nau, vomit, derm, liver, kidney, CVS damage; [canc]	Eye: Skin: Breath: Swallow: Irrigated Soap wash prompt Respiratory support Medical attention immed	Eyes, skin, kidneys, liver, CNS, CVS [in animals: fovealomech, mammary gland & circulatory system cancer]
[Ethylene dichloride]						
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam Daily	TBAL	Inh Ing Con	Irr eyes, skin, nose, throat; nau, vomit, abdomen pain, weak; dizz, stupor, convuls, CNS depress; skin sens	Eye: Skin: Breath: Swallow: Irrigated Water wash Respiratory support Medical attention immed	Eyes, skin, resp sys, CNS
[Ethylene glycol]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL, F.P., IP, Sp. Gr., flammability	VP, FRZ UEL, LEL		
Ethylene glycol dinitrate $O_2NOCH_2CH_2ONO_2$ 628-96-6 KW5600000	EGDN; 1,2-Ethanedioyl dinitrate; Ethylene dinitrate; Ethylene nitrate; Glycol dinitrate; Nitroglycol 1 ppm = 6.12 mg/m ³	NIOSH STO 1 mg/m ³ [skin] OSHA† C 0.2 ppm (1 mg/m ³) [skin]	78 mg/m ³	Colorless to yellow, oily, odorless liquid [Note: An explosive ingredient (60-80%) in dynamite along with nitrogly- cerine (40-20%).]	MW 152.1 BP 387°F Sol: Insoluble F.P. 419°F IP: ? Sp. Gr. 1.49 Explosive Liquid	VP 0.05 mm FRZ -8°F UEL ? LEL ?	Acids, alkalis	Tenax GC; Ethanol; GC/ECD; II [#2507]
Ethyleneimine C_2H_5N 151-56-4 KX5075000	Aminoethylene; Azirane; See Appendix A Dimethylenimine; Dimethylenimine; Ethyleneimine; Ethylamine 1185-30 (inhibited) 1 ppm = 1.79 mg/m ³	NIOSH Ca See Appendix A OSHA [1910.1012] See Appendix B	Ca [100 ppm]	Colorless liquid with an ammonia- like odor [Note: Usually contains inhibi- tors to prevent polymerization.]	MW 43.1 BP 133°F Sol: Miscible F.P. 12°F IP: 9.20 eV Sp. Gr. 0.83 Class IB Flammable Liquid	VP 160 mm FRZ -97°F UEL 54.8% LEL 3.3%	Polymerizes explosively in presence of acids [Note: Explosive silver derivatives may be formed with silver alloys (e.g., silver solder).]	Bub. CHCl ₃ HPLC/UV/D. II [P&CAM #300]
Ethylene oxide C_2H_4O 75-21-8 KX2450000	Dimethylene oxide; 1,2-Epoxy ethane; Oxirane 1040-89 1 ppm = 1.83 mg/m ³	NIOSH Ca See Appendix A C 0.1 ppm (0.16 mg/m ³) C 5 ppm (9 mg/m ³) [10-min/day] OSHA [1910.1047] 1 ppm 5 ppm [15-min Excursion]	Ca [800 ppm]	Colorless gas or liquid (below 51°F) with an ether-like odor.	MW 44.1 BP 51°F Sol: Miscible F.P. NA (Gas) -20°F (Liq) IP: 10.56 eV R.G.A.D.: 1.49 Sp. Gr. 0.82 (Liquid at 50°F) Flammable Gas Class IA Flammable Liquid	VP 1.46 atm FRZ -171°F UEL 100% LEL 3.0%	Strong acids, alkalis & oxidizers; chlorides of iron, aluminum & tin; oxides of iron & aluminum, water	Char(pet)*; DMF; GC/ECD; II [#1514]
Ethylene thiourea $C_2H_4N_2S$ 98-46-7 NI9828000	1,3-Ethylene-2-thiourea; N,N-Ethylenethiourea; ETU; 2-Imidazolidine-2-thione OSHA none	NIOSH Ca See Appendix A Use encapsulated form	Ca [N.D.]	White to pale-green, crystalline solid with a faint, amine odor. [Note: Used as an accelerator in the curing of poly- chloroprene & other elastomers.]	MW: 102.2 BP: 446-598°F Sol (84°F): 2% F.P. 486°F IP: 5.15 eV Sp. Gr. ? Combustible Solid	VP: 16 mm MLT: 392°F UEL: ? LEL: ?	Acrolein	Filter; water; Vib; II [#5011]

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	Prevent skin contact	NIOSH	Inh	Throb, head, dizz, nau,	Eye	Skin, CVS, blood
Eyes:	Prevent eye contact	1 mg/m ³ SA*	Abs	vomit, abdom pain,	Soap wash, immed	liver, kidneys
Wash skin:	When contam	2.5 mg/m ³ SA CF*	Ing	hypotension, flush, palp	Resp support	
Remove:	When wet (flam)	5 mg/m ³ SAT CF*/SCBAF/SAF	Con	angina, methemo, delirium,	Medical attention	
Change:	Daily	75 mg/m ³ SAF/PD, PP		CNS depres, irrit skin,	immed	
Provide:	Quick drench	§ SCBAF, PD, PP/SAF, PD, PP ASCBA		in animals: anemia,		
		Escape: GMFOVHIE/SCBAE		liver, kidney damage		
[Ethylene glycol dinitrate]						
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, skin, nose	Eye	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	§ SCBAF, PD, PP/SAF, PD, PP ASCBA	Abs	throat, nau, vomit, head,	Soap wash, immed	liver, CNS, blood
Wash skin:	When contam/Daily	Escape: GMFOVHIE/SCBAE	Ing	dizz, pulm edema, liver,	Resp support	kidneys
Remove:	When wet or contam		Con	kidney damage, eye burns,	Medical attention	[in animals:
Change:	Daily			skin sens. [canc]	immed	lung & liver
Provide:	Eyewash, Quick drench					tumors]
[Ethyleneimine]						
Skin:	Prevent skin contact (liq)	NIOSH	Inh	Irrit eyes, skin, nose,	Eye	Eyes, skin, resp sys,
Eyes:	Prevent eye contact (liq)	5 ppm GMFS*/SCBAF/SAF	liq	throat, peculiar taste	Water flush, immed	liver, CNS, blood
Wash skin:	When contam (liq)	§ SCBAF, PD, PP/SAF, PD, PP ASCBA	(liq)	head, nau, vomit, diarr,	Resp support	kidneys, repro sys
Remove:	When wet (flam)	Escape: GMFS*/SCBAE	Con	dysp, cyan, pulm edema,	Medical attention	[peritoneal cancer,
Change:	N.R.			drow, inco, EKG abnor; eye,	immed (liq)	leukemia]
Provide:	Quick drench (liq)			skin burns (liq or high		
				vap conc); liq, frostable,		
				repro effects; [canc],		
				in animals: convuls,		
				liver, kidney damage		
[Ethylene oxide]						
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes;	Eye:	Eyes, skin, thyroid,
Eyes:	Prevent eye contact	§ SCBAF, PD, PP/SAF, PD, PP ASCBA	liq	in animals: thickening of	Soap wash, immed	repro sys
Wash skin:	When contam/Daily	Escape: GMFOVHIE/SCBAE	Con	the skin; goiter, terato	Resp support	[in animals: liver,
Remove:	When wet or contam			effects; [canc]	Medical attention	thyroid & lymphatic
Change:	Daily				immed	tumors]
[Ethylene thiourea]						

Chemical name, structural formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TLV unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P., IP, Sp. Gr, Flammability	VP, FRZ UEL, LEL		
Ethyl ether $C_2H_5OC_2H_5$ 60-29-7 K05775000	Diethyl ether Diethyl oxide Ether Ethyl oxide Solvent ether	NIOSH See Appendix D OSHA† 400 ppm (1200 mg/m ³)	1900 ppm [LEL]	Colorless liquid with a pungent, sweetish odor [Note: A gas above 94°F.]	MW 74.1 BP 94°F Sol 8% Fl.P. -49°F IP 9.53 eV	VP 440 mm FRZ -177°F UEL 36.0% LEL 1.9%	Strong oxidizers, halogens, sulfur, sulfur compounds [Note: Tends to form explosive peroxides under influence of air and light.]	Char. Ethyl acetate, GC/FID III [#1610]
1155 26	1 ppm = 3.06 mg/m ³				Sp Gr 0.71 Class IA Flammable Liquid			
Ethyl formate CH_3CH_2OCHO 109-94-4 LQ8400000	Ethyl ester of formic acid, Ethyl methanoate	NIOSH/OSHA 100 ppm (300 mg/m ³)	1500 ppm	Colorless liquid with a fruity odor	MW 74.1 BP 130°F Sol (64°F) 8% Fl.P. -41°F IP 10.61 eV	VP 300 mm FRZ -113°F UEL 16.0% LEL 2.8%	Nitrates, strong oxidizers, alkalis & acids [Note: Decomposes slowly in water to form ethyl alcohol and formic acid.]	Char. CS, GC/FID III [#1452]
1190 26	1 ppm = 3.06 mg/m ³				Sp Gr 0.92 Class IB Flammable Liquid			
Ethylidene norbornene C_7H_{10} 16219-75-3 RB9460000	ENB, 5-Ethylidenebicyclo(2.2.1)- hept-2-ene, 5-Ethylidene-2-norbornene [Note: Due to its reactivity, ENB may be stabilized with tert-butyl catechol.] 1 ppm = 5.00 mg/m ³	NIOSH C 5 ppm (25 mg/m ³) OSHA† none	N.D.	Colorless to white liquid with a turpentine-like odor.	MW: 120.2 BP: 298°F Sol: 7 Fl.P (oc): 101°F IP: 7	VP: 4 mm FRZ: -112°F UEL: 7 LEL: 7	Oxygen [Note: ENB should be stored in a nitrogen atmosphere since it reacts with oxygen.]	None available
Ethyl mercaptan CH_3CH_2SH 75-08-1 K19625000	Ethylmercaptan, Ethyl sulfhydryle, Mercaptoethane	NIOSH C 0.5 ppm (1.3 mg/m ³) (15-min) OSHA† C 10 ppm (25 mg/m ³)	500 ppm	Colorless liquid with a strong, skunk-like odor [Note: A gas above 95°F.]	MW 62.1 BP 95°F Sol 0.7% Fl.P. -55°F IP 9.29 eV	VP 442 mm FRZ -228°F UEL 18.0% LEL 2.8%	Strong oxidizers [Note: Reacts violently with calcium hypochlorite.]	Filter; HClOCE; GC/FID; III [#2842]
2363 27	1 ppm = 2.58 mg/m ³				Sp Gr 0.84 Class IA Flammable Liquid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection -- maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact N.R. When wet (flamm) N.R.	OSHA 1900 ppm: CCROV*/GMFOV/PAPROV*/ SA*/SCBAF § SCBAF PD, PP/SAF PD, PP ASCBA Escape GMFOV/SCBAE	Inh Ing Con	Irrit eyes, skin, upper resp sys, dizz, drow, head, excited, narco, nau, vomit	Eye Skin Breath Swallow: Irr immed Water wash prompt Resp support Medical attention immed	Eyes, skin, resp sys, CNS
[Ethyl ether]						
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet (flamm) N.R.	NIOSH/OSHA 1500 ppm: SA, CF/PAPROV*/CCRFOV/ GMFOV/SCBAF/SAF § SCBAF PD, PP/SAF PD, PP ASCBA Escape GMFOV/SCBAE	Inh Ing Con	Irrit eyes, upper resp sys. In animals: narco	Eye Skin Breath Swallow: Irr immed Water flush immed Resp support Medical attention immed	Eyes, resp sys, CNS
[Ethyl formate]						
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact Daily When wet or contam N.R.	TBAL	Inh Abs Ing Con	Irrit eyes, skin, nose, throat; head; cough, dysp; nau, vomit; olfactory, taste changes; chemical pneu (aspir liq); In animals: liver, kidney, urogenital inj, bone marrow effects	Eye: Skin: Breath: Swallow: Irr immed Soap wash immed Resp support Medical attention immed	Eyes, skin, resp sys, CNS, liver, kidneys, urogenital sys, bone marrow
[Ethylidene norbornene]						
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact Daily When wet (flamm) N.R.	NIOSH 5 ppm: CCROV/SA 12.5 ppm: SA, CF/PAPROV 25 ppm: CCRFOV/GMFOV/SAT, CF/ PAPROV/SCBAF/SAF 500 ppm: SA, PD, PP § SCBAF PD, PP/SAF PD, PP ASCBA Escape GMFOV/SCBAE	Inh Ing Con	Irrit muc memb, head, nau, in animals: inco, weak, liver, kidney damage, damage, cyan, narco	Eye Skin Breath Swallow: Irr immed Soap wash immed Resp support Medical attention immed	Eyes, resp sys, liver, kidneys, blood
[Ethyl mercaptan]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl, P, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
N-Ethylmorpholine $C_4H_9ONCH_2CH_3$ 100-74-3 QE4025000	4-Ethylmorpholine	NIOSH 5 ppm (23 mg/m ³) [skin] OSHA† 20 ppm (94 mg/m ³) [skin]	100 ppm	Colorless liquid with an ammonia- like odor	MW 115.2 BP 281°F Sol. Miscible Fl P (oc) 90°F IP ?	VP 6 mm FRZ -81°F UEL ? LEL ?	Strong acids strong oxidizers	Sig el, H ₂ SO ₄ GC/FID II(3) [#S146]
	1 ppm = 4.79 mg/m ³				Sp Gr. 0.90 Class IC Flammable Liquid			
Ethyl silicate $(C_2H_5)_4SiO_4$ 78-10-4 VV9450000	Ethyl orthosilicate Ethyl silicate (condensed) Tetraethoxysilane Tetraethyl orthosilicate Tetraethyl silicate	NIOSH 10 ppm (85 mg/m ³) OSHA† 100 ppm (850 mg/m ³)	700 ppm	Colorless liquid with a sharp alcohol-like odor.	MW 208.3 BP 336°F Sol. Reacts Fl P Reacts IP 97°F	VP 1 mm FRZ -117°F UEL ? LEL ?	Strong oxidizers, water [Note: Reacts with water to form a silicone adhesive (a milky-white mass).]	XAD-2, CS, GC/FID II(3) [#S264]
1292 29	1 ppm = 8.66 mg/m ³				Sp Gr. 0.93 Class IC Flammable Liquid			
Fenamphos $C_{11}H_{19}NO_3PS$ 22224-92-8 TB3675000	Ethyl 3-methyl-4-(methyl- thio)phenyl-(1-methyl- ethyl)phosphoramidate, Fenacur® Phenamphos	NIOSH 0.1 mg/m ³ [skin] OSHA† none	N.D.	Off-white to tan, waxy solid. [Insecticide] [Note: Found commercially as a granular ingredi- ent (5-15%) or in an emulsifiable concentrate (400 g/l).]	MW: 303.4 BP: ? Sol: 0.03% Fl P: ? IP: ?	VP: 0.00005 mm MLT: 121°F UEL: ? LEL: ?	None reported [Note: May hydrolyze under alkaline conditions.]	None available
					Sp.Gr: 1.14			
Fensulfthion $C_{11}H_{19}O_2PS_2$ 115-90-2 TF3850000	Desanil®; O,O-Diethyl O-(p-methyl- sulfonylphenyl)- phosphorothioate; Terracur PS® [[C ₂ H ₅ O] ₂ P(S)OC ₆ H ₄ S(O)CH ₃]	NIOSH 0.1 mg/m ³ OSHA† none	N.D.	Brown liquid or yellow oil [pesticide]	MW: 308.4 BP: ? Sol(77°F): 0.2% Fl P: ? IP: ?	VP: ? FRZ: ? UEL: ? LEL: ?	Alkali	None available
	1 ppm = 12.82 mg/m ³				Sp Gr: 1.20 Combustible Liquid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)	
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet (flam) N.R. Eyewash (>10%), Quick drench	NIOSH 50 ppm: CCROV/SA* 100 ppm: SA:CF/PAPROV/CCRFOV/ GMFOV/SCBAF/SAF § SCBAF PD,PP/SAF PD,PP ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, nose, throat, vis dist, corn edema, blue-gray vision, colored halos	Eye: Skin: Breath: Swallow:	Irr/med Water flush prompt Resp support Medical attention imed	Eyes, resp sys
[N-Ethylmorpholine]							
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet (flam) N.R.	NIOSH 100 ppm: SA* 250 ppm: SA CF* 500 ppm: SCBAF/SAF 700 ppm: SAF/PD,PP § SCBAF PD,PP/SAF PD,PP ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, nose, in animals: lac, dysp, pulm edema, tremor, narco; liver, kidney damage, anemia	Eye: Skin: Breath: Swallow:	Irr/med Soap wash prompt Resp support Medical attention imed	Eyes, resp sys, Eyes liver, kidneys, blood, skin
[Ethyl silicate]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam/Daily When wet or contam Daily Quick drench	TBAL	Inh Abs Ing Con	Nau, vomit, abdom cramps, diarr, saliv; head, gidd, vert, weak; rin, chest tight; blurred vision, miosis; card irreg; musc fasc; dysp	Eye: Skin: Breath: Swallow:	Irr/med Soap flush/med Resp support Medical attention imed	Resp sys, CNS, CVS, blood chol
[Fenamphos]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R. Eyewash, Quick drench	TBAL	Inh Abs Ing Con	Irrit skin; nau, vomit, abdom cramps, diarr, saliv; head, gidd, vert, weak; rin, chest tight; blurred vision, miosis; card irreg; musc fasc; dysp	Eye: Skin: Breath: Swallow:	Irr/med Soap flush/med Resp support Medical attention imed	Skin, resp sys, CNS, CVS, blood chol

[Fenathion]

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TLWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL, FLP, IP, Sp, Gr, flammability	VP, FRZ, UEL, LEL		
Fenthion $C_{12}H_{18}O_3PS$ 55-38-9 TF9625000	Baytex®; Entex®; O,O-Dimethyl O-3-methyl-4-methylthiophenyl phosphorothioate [[CH ₃ O] ₂ P(S)OC ₆ H ₄ (CH ₃)SCH ₃]	NIOSH See Appendix D OSHA† none	N.D.	Colorless to brown liquid with a slight, garlic-like odor. [insecticide]	MW: 278.3 BP: ? Sol: 0.006% FLP: NA IP: ? Sp.Gr: 1.25 Noncombustible Liquid	VP: 0.00003 mm FRZ: 43°F UEL: NA LEL: NA	Oxidizers	None available
Ferbam [[CH ₃] ₂ NCS] ₂ Fe 14484-64-1 NO8750000	Is[Dimethyldithio-carbamato]iron, Ferric dimethyl dithio-carbamate	NIOSH 10 mg/m³ OSHA† 15 mg/m³	800 mg/m³	Dark brown to black, odorless solid. [fungicide]	MW 416.5 BP Decomposes Sol 0.01% FLP ? IP 7.72 eV Sp.Gr ? Combustible Solid	VP: 0 mm (approx) FRZ: 43°F MLT: >356°F (Decomposes) UEL: ? LEL: ? MEC: 55 g/m³	Strong oxidizers, moisture	None available
Ferrovandium dust FeV 12604-58-9 LK2900000	Ferrovandium	NIOSH* 1 mg/m³ ST 3 mg/m³ [Note: The REL also applies to Vanadium metal and Vanadium carbide.] OSHA† 1 mg/m³	500 mg/m³	Dark, odorless particulate dispersed in air. [Note: Ferrovandium metal is an alloy usually containing 50-80% vanadium]	MW 106.8 BP: ? Sol: Insoluble FLP: NA IP: NA Sp.Gr ? Metal: Noncombustible Solid, but dust may be an explosion hazard.	VP: 0 mm (approx) MLT: 2696-2768°F UEL: NA LEL: NA MEC: 1.3 g/m³	Strong oxidizers	Fiber, Acid, AAS, OSHA [H121, #D125G]
Fibrous glass dust LK3651000	Fiber glass®, Fiberglass, Glass fibers, Glass wool [Note: Usually produced from borosilicate & low alkali silicate glasses.]	NIOSH 3 fibers/cm³ (fibers < 3.5 µm in diameter & ≥ 10 µm in length) 5 mg/m³ (total) OSHA 15 mg/m³ (total) 5 mg/m³ (resp)	N.D.	Typically, glass filaments >3 µm in diameter or glass "wool" with diameters down to 0.05 µm & >1 µm in length.	MW: NA BP: NA Sol: Insoluble FLP: NA IP: NA Sp.Gr: 2.5 Noncombustible Fibers	VP: 0 mm (approx) MLT: ? UEL: NA LEL: NA	None reported	Fiber, none, Grav, B [H500, Hazardous Dust (total)] [Also #7400]

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	Prevent skin contact	TBAL	Inh	Nau, vomit, abdom cramps,	Eye:	Resp sys, CNS, CVS,
Eyes:	Prevent eye contact		Abs	diarr, saliv; head, gidd,	Skin:	plasma chol
Wash skin:	When contam		Ing	vert, weak; thin, chest	Breath:	
Remove:	When wet or contam		Con	tight; blurred vision,	Swallow:	
Change:	Daily			mosis; card irregularities;		
				muscle fasc; dysp		
[Fenthion]						
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, resp tract,	Eye:	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	50 mg/m ³ D	Ing	derm, GI dist	Skin:	GI tract
Wash skin:	When contam	100 mg/m ³ DXSQ*HIE*YA*	Con		Breath:	
Remove:	When wet or contam	250 mg/m ³ SA CF*IPAPRD*			Swallow:	
Change:	Daily	500 mg/m ³ HIEF/SAT CF*IPAPRTHIE*Y				
		SCBAF/SAF				
		800 mg/m ³ SAF PD PP				
		§ SCBAF PD PP/SAF PD PP ASCBA				
		Escape: HIEF/SCBAE				
[Farbam]						
Skin:	N.R.	NIOSH/OSHA	Inh	Irrit eyes, resp sys,	Eye:	Eyes, resp sys
Eyes:	N.R.	5 mg/m ³ DM*	Con	in animals: bron,	Breath:	
Wash skin:	N.R.	10 mg/m ³ DMXSQ*/SA*		pneutis		
Remove:	N.R.	25 mg/m ³ SA CF*IPAPRD*				
Change:	N.R.	50 mg/m ³ HIEF/SAT CF/PA PRTHIE*Y				
		SCBAF/SAF				
		500 mg/m ³ SAF PD PP				
		§ SCBAF PD PP/SAF PD PP ASCBA				
		Escape: HIEF/SCBAE				
[Ferrovanadium dust]						
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, skin, nose,	Eye:	Eyes, skin, resp sys
Eyes:	Prevent eye contact	5X REL: D	Con	throat; dysp	Breath:	
Wash skin:	Daily	10X REL: DXSQ/HIE/SA				
Remove:	N.R.	25X REL: SA CF/PA PRD				
Change:	Daily	50X REL: HIEF/PA PRTHIE/SCBAF/SAF				
		1000X REL: SAF PD PP				
		§ SCBAF PD PP/SAF PD PP ASCBA				
		Escape: HIEF/SCBAE				
[Fibrous glass dust]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Fluorine F_2 7782-41-4 LM6475000 9192 25 (cryogenic liquid) 1045 20 (compressed)	Fluorine-19 1 ppm = 1.58 mg/m ³	NIOSH/OSHA 0 1 ppm (0.2 mg/m ³)	25 ppm	Pale-yellow to greenish gas with a pungent, irritating odor.	MW: 38.0 BP: -307°F Sol: Reacts FLP: NA IP: 15.70 eV	VP: >1 atm FRZ: -363°F UEL: NA LEL: NA	Water, nitric acid, oxidizers, organic compounds [Note: Reacts violently with all combustible materials, except the metal containers in which it is shipped. Reacts with H ₂ O to form hydrofluoric acid.]	None available
Fluorotrichloromethane CF_3Cl 75-69-4 PB6125000	Freon® 11, Monofluorotrichloromethane, Refrigerant 11, Trichlorofluoromethane, Trichloromonofluoromethane 1 ppm = 5.71 mg/m ³	NIOSH C 1000 ppm (5600 mg/m ³) OSHA† 1000 ppm (5600 mg/m ³)	2000 ppm	Colorless to water-white, nearly odorless liquid or gas (above 75°F)	MW: 137.4 BP: 75°F Sol(75°F): 0% FLP: NA IP: 11.77 eV Sp. Gr: 1.47 (Liquid at 75°F) RGasD: 4.74 Noncombustible Liquid Nonflammable Gas	VP: 690 mm FRZ: -168°F UEL: NA LEL: NA	Chemically-active metals such as sodium, potassium, calcium, powdered aluminum, zinc, magnesium & lithium shavings, granular barium	Char, CS, GC/MS, IR [#1006, Trichloro- fluoro- methane]
Fluoroxene $CF_3CH_2OCH=CH_2$ 406-90-6 KO4250000	2,2,2-Trifluoroethoxy- ethene; 2,2,2-Trifluoroethyl vinyl ether 1 ppm = 5.24 mg/m ³	NIOSH* C 2 ppm (10.3 mg/m ³) (80-min) [*Note: REL for exposure to waste anesthetic gas.] OSHA none	N.D.	Liquid, [Inhalation anesthetic] [Note: A gas above 109°F.]	MW: 126.1 BP: 109°F Sol: ? FLP: ? IP: ?	VP: 286 mm FRZ: ? UEL: ? LEL: ?	None reported	None available
Fonofos $C_{10}H_{14}OPS_2$ 944-22-9 TA5950000	Dyfonate®, Dyphonate, O-Ethyl-S-phenyl ethyl- phosphorothioate, Fonophos 1 ppm = 10.24 mg/m ³	NIOSH 0.1 mg/m ³ [skin] OSHA† none	N.D.	Light-yellow liquid with an aromatic odor, [Insecticide]	MW: 246.3 BP: ? Sol: 0.001% FLP: >201°F IP: ?	VP(77°F): 0.0002 mm FRZ: ? UEL: ? LEL: ?	None reported	None available
					Sp.Gr: 1.15 Class III Combustible Liquid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	Prevent skin contact (liq)	NIOSH/OSHA	Inh	Irrit eyes, nose, resp sys;	Eye	Eyes, skin, resp sys
Eyes:	Prevent eye contact	1 ppm SA*	Con	Irr spasm; bron spasm;	Skin	liver, kidneys
Wash skin:	When contam (liq)	2.5 ppm SA CF*		pulm edema; eye, skin burns;	Breath	
Remove:	When wet or contam (liq)	5 ppm SCBAF/SAF		in animals: liver, kidney	Immered	
Change:	N.R.	25 ppm SAF PD PP		damage	Water flush	
Provide:	Eyewash (liq), Quick drench (liq)	5 SCBAF PD PP/SAF PD PP ASCBA			Resp support	
		Escape: GMFS/SCBAE				
[Fluorine]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Inco, tremor, derm, card	Eye	Skin, resp sys, CVS
Eyes:	Prevent eye contact	2000 ppm SA/SCBAF	Ing	army, card arrest, asphy;	Skin	
Wash skin:	N.R.	5 SCBAF PD PP/SAF PD PP ASCBA	Con	liq: frostbite	Breath	
Remove:	When wet or contam	Escape: GMFOV/SCBAE			Swallow	
Change:	N.R.				Medical attention	
Provide:	Eyewash, Quick drench				immed	
[Fluorotrichloromethane]						
Skin:	N.R.	TBAL	Inh	Irrit eyes; CNS depres,	Eye:	Eyes, CNS
Eyes:	Prevent eye contact		Ing	analgesia, anes, aez,	Skin:	
Wash skin:	N.R.		Con	resp depres	Breath:	
Remove:	N.R.				Swallow;	
Change:	N.R.				Irr Immered	
					Soap wash	
					Resp support	
					Medical attention	
					immed	
[Fluoroxene]						
Skin:	Prevent skin contact	TBAL	Inh	Nau, vomit, abdom cramps,	Eye:	Resp sys, CNS, CVS,
Eyes:	Prevent eye contact		Ab	diarr, saliv, head, gidd,	Skin:	blood chol
Wash skin:	When contam		Ing	vert, weak, rin, chest	Breath:	
Remove:	When wet or contam		Con	tight; blurred vision,	Swallow:	
Change:	Daily			miosis; card irreg; musc	Immered	
Provide:	Eyewash, Quick drench			fasc; dysp		
[Fonofos]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL F.L.P., IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Formaldehyde HCHO 50-00-0 LP8925000	Methanal Methyl aldehyde Methylene oxide 1 ppm = 1.25 mg/m ³	NIOSH Ca See Appendix A 0.016 ppm C 0.1 ppm [15-min] OSHA [1910.1048] 0.75 ppm ST 2 ppm	Ca [20 ppm]	Nearly colorless gas with a pungent, suffocating odor [Note: Often used in an aqueous solution (see specific listing for Formalin).]	MW: 30.0 BP: -6°F Sol: Miscible F.L.P. NA (Gas) IP: 10.88 eV RGasD: 1.04 Flammable Gas	VP: >1 atm FRZ: -134°F UEL: 73% LEL: 70%	Strong oxidizers, alkalis & acids phenols, urea [Note: Pure formaldehyde has a tendency to polymerize. Reacts with HCl to form bis-chloromethyl ether.]	Filter/Imp(2), none, Vis, IR [#3500] [Note: Also XAD-2; Toluene; GC/FID, #2541.]
Formalin (as formaldehyde) 1198-29 2209-29	Formaldehyde solution [Note: Formalin is an aqueous solution that is 37% formaldehyde by weight; inhibited solutions contain 8-12% methyl alcohol. Also see specific listings for Formaldehyde and Methyl alcohol.]	NIOSH Ca See Appendix A 0.018 ppm C 0.1 ppm [15-min] OSHA [1910.1048] 0.75 ppm ST 2 ppm	Ca [20 ppm]	Colorless liquid with a pungent odor.	MW: Varies BP: 214°F Sol: Miscible F.L.P.: 185°F IP: ? Sp. Gr: 1.08 Class IIIA Combustible Liquid	VP: 1 mm FRZ: 7 UEL: 73% LEL: 7%	Strong oxidizers, alkalis & acids; phenols, urea, oxides; isocyanates, caustics; anhydrides	Filter/Imp(2), none; Vis; IR [#3500] [Note: Also XAD-2; Toluene; GC/FID, #2541.]
Formamide HCONH ₂ 75-12-7 LQ0525000	Carbamide, N- methanamide 1 ppm = 1.87 mg/m ³	NIOSH 10 ppm (15 mg/m ³) [skin] OSHA† none	N.D.	Colorless, oily liquid. [Note: A solid below 37°F.]	MW: 45.1 BP: 411°F (Decomposes) Sol: Miscible F.L.P.(oc): 310°F IP: 10.20 eV Sp. Gr: 1.13 Class IIIB Combustible Liquid	VP(88°F): 0.1 mm FRZ: 37°F UEL: ? LEL: ?	Oxidizers, iodine, pyridine, sulfur trioxide, copper, brass, lead [Note: Hygroscopic (i.e., absorbs moisture from the air).]	None available
Formic acid HCOOH 64-18-6 LQ4900000 1779-60	Formic acid (85-95% in aqueous solution); Hydrogen carboxylic acid; Methanoic acid 1 ppm = 1.91 mg/m ³	NIOSH/OSHA 5 ppm (9 mg/m ³)	30 ppm	Colorless liquid with a pungent, penetrating odor [Note: Often used in an aqueous solution.]	MW: 46.0 BP: 224°F (90% soln.) Sol: Miscible F.L.P.(oc): 122°F (90% soln.) IP: 11.05 eV Sp Gr: 1.22 (90% solution) Class II Combustible Liquid (80% solution)	VP: 35 mm FRZ: 20°F (90% soln.) UEL: 57% (90% soln.) LEL: 18% (90% soln.)	Strong oxidizers, strong caustics, concentrated sulfuric acid [Note: Corrosive to metals.]	Sp. Gr†: Water; IC, IR [#1616]

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)		Target organs (See Table 5)
Skin:	N.R.	NIOSH	Inh	Irrit eyes, nose, throat,	Eye	Irritated	Eyes, resp sys
Eyes:	Prevent eye contact	§ SCBAF PD PP/SAF PD PP ASCBA	Con	resp sys; lac, cough, bron spasm, [canc]	Breath	Resp support	[nasal cancer]
Wash skin:	N.R.	Escape: GMFS/SCBAE					
Remove:	N.R.						
Change:	N.R.						

[Formaldehyde]

Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, nose, throat,	Eye	Irritated	Eyes, skin, resp sys
Eyes:	Prevent eye contact	§ SCBAF PD PP/SAF PD PP ASCBA	Ing	resp sys, lac, cough,	Skin	Water flush prompt	[nasal cancer]
Wash skin:	When contam	Escape: GMFS/SCBAE	Con	bron spasm; dermat; [canc]	Breath:	Resp support	
Remove:	When wet or contam				Swallow	Medical attention	
Change:	N.R.					immed	
Provide:	Eyewash, Quick drench						

[Formalin (as formaldehyde)]

Skin:	N.R.	TBAL	Inh	Irrit eyes, skin, muc memb;	Eye:	Irr, immed	Eyes, skin, resp sys,
Eyes:	Prevent eye contact		Ing	drow, rig; nau, acidosis;	Skin:	Water wash	CNS, repro sys
Wash skin:	N.R.		Con	skin eruptions;	Breath:	Resp support	
Remove:	N.R.			in animals: repro effects	Swallow:	Medical attention	
Change:	N.R.					immed	

[Formamide]

Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin, throat,	Eye	Irritated	Eyes, skin, resp sys
Eyes:	Prevent eye contact	30 ppm SA/SCBAF	Ing	skin burns, dermat, lac,	Skin	Water flush immed	
Wash skin:	When contam	§ SCBAF PD PP/SAF PD PP ASCBA	Con	rhin; cough, dysp, nau	Breath	Resp support	
Remove:	When wet or contam	Escape: GMFOVH/SCBAE			Swallow	Medical attention	
Change:	N.R.					immed	
Provide:	Eyewash, Quick drench						

[Formic acid]

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL, FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Furfural $C_5H_4O_2$ 98-01-1 LT7000000	Fural, 2-Furancarboxaldehyde, Furfuraldehyde 2-Furfuraldehyde	NIOSH See Appendix D OSHA† 5 ppm (20 mg/m³) [skin]	100 ppm	Colorless to amber liquid with an almond-like odor. [Note: Darkens in light and air.]	MW: 96.1 BP: 32.3°F Sol: 8% F.P. 140°F IP: 9.21 eV	VP: 2 mm FRZ: -34°F UEL: 19.3% LEL: 2.1%	Strong acids, oxidizers, strong alkalis [Note: May polymerize on contact with strong acids or strong alkalis.]	XAD-2*, Toluene, GC/FID, II [#2529]
1199 29	1 ppm = 3.99 mg/m³				Sp Gr 1.16 Class IIIA Combustible Liquid			
Furfuryl alcohol $C_5H_6O_2$ 98-00-0 LU9100000	2-Furylmethanol, 2-Hydroxymethylfuran	NIOSH 10 ppm (40 mg/m³) ST 15 ppm (60 mg/m³) [skin] OSHA† 50 ppm (200 mg/m³)	75 ppm	Colorless to amber liquid with a faint, burning odor. [Note: Darkens on exposure to light.]	MW: 98.1 BP: 338°F Sol: Miscible F.P. 149°F IP: ?	VP(77°F): 0.6 mm FRZ: 6°F UEL: 16.3% LEL: 1.8%	Strong oxidizers & acids [Note: Contact with organic acids may lead to polymerization.]	Porapak-Q, Acetone, GC/FID, III [#2505]
2874 55	1 ppm = 4.08 mg/m³				Sp Gr 1.13 Class IIIA Combustible Liquid			
Gasoline 8006-61-9 LX3300000	Motor fuel, Motor spirits, Natural gasoline, Petrol [Note: A complex mixture of volatile hydrocarbons (paraffins, cycloparaffins & aromatics).]	NIOSH Ca See Appendix A OSHA† none	Ca [N.D.]	Clear liquid with a characteristic odor.	MW: 72 (approx) BP: 102°F Sol: Insoluble F.P.: -45°F IP: ?	VP: 38-300 mm FRZ: ? UEL: 7.6% LEL: 1.4%	Strong oxidizers such as peroxides, nitric acid & perchlorates	None available
1203 27	1 ppm = 3.00 mg/m³ (approx)				Class IB Flammable Liquid			
Germanium tetrahydride GeH_4 7782-65-2 LY4900000	Germane, Germanium hydride, Germanomethane, Monogermene [Note: Used chiefly for the production of high purity germanium for use in semiconductors.]	NIOSH 0.2 ppm (0.6 mg/m³) OSHA† none	N.D.	Colorless gas with a pungent odor. [Note: Shipped as a compressed gas.]	MW: 76.6 BP: -127°F Sol: Insoluble F.P.: NA (Gas) IP: 11.34 eV	VP: >1 atm FRZ: -267°F UEL: ? LEL: ?	Bromine	None available
2192 18	1 ppm = 3.18 mg/m³				RGasD: 2.65 Flammable Gas (may ignite SPONTANEOUSLY in air).			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection -- maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R.	OSHA 50 ppm: CCROV/SA* 100 ppm: SA/CF/ICCRFOV/PAPROV/ GMFOV/SCBAF/SAF 5 SCBAF PD PP/SAF PD PP ASCBA Escape GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, skin, upper resp sys, head, derm	Eye Skin Breath Swallow Immed Water flush prompt Resp support Medical attention	Eyes, skin, resp sys
[Furfural]						
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R. Quick drench	NIOSH/OSHA 75 ppm: CCROV/GMFOV/PAPROV/ SA*/SCBAF 5 SCBAF PD PP/SAF PD PP ASCBA Escape GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, muc memb; dizz, nau, diarr, diuresis, resp, body temperature depres, vomit, derm	Eye Skin Breath Swallow Immed Water flush immed Resp support Medical attention	Eyes, skin, resp sys CNS
[Furfuryl alcohol]						
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet (flamm) N.R. Eyewash, Quick drench	NIOSH 4 SCBAF PD PP/SAF PD PP ASCBA Escape GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, skin, muc memb; derm; head, fig, blurred vision, dizz, slurred speech, conf, convulse; chemical prau (aspirin); possible liver, kidney damage; [canc]	Eye Skin Breath Swallow Immed Soap flush immed Resp support Medical attention	Eyes, skin, resp sys, CNS, liver, kidneys [in animals: liver & kidney cancer]
[Gasoline]						
Skin: Eyes: Wash skin: Remove: Change:	N.R. N.R. N.R. N.R. N.R.	TBAL	Inh	Head, head, gidd, fainting; dysp; nau, vomit; kidney inj; hemolytic effects	Breath: Resp support	CNS, kidneys, blood

[Germanium tetrahydride]

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Glutaraldehyde $\text{OCH}(\text{CH}_2)_3\text{CHO}$ 111-30-8 MA2450000	Glutaric dialdehyde; 1,5-Pentanedial	NIOSH C 0.2 ppm (0.8 mg/m ³) See Appendix C (Aldehydes) OSHA† none	N.D.	Colorless liquid with a pungent odor.	MW: 100.1 BP: 212°F Sol: Miscible FLP: NA IP: ? Sp.Gr: 1.10 Noncombustible Liquid	VP: 17 mm FRZ: 7°F UEL: NA LEL: NA	Strong oxidizers, strong bases [Note: Alkaline solutions of glutaraldehyde (i.e., activated glutaraldehyde) react with alcohol, ketones, amines, hydrazines & proteins.]	XAD-2; Tokene; GC/FID; II [#2531]
Glycerin (mist) $\text{HOCH}_2\text{CH}_2(\text{OH})\text{CH}_2\text{OH}$ 56-81-5 MA8050000	Glycerin (anhydrous); Glycerol; Glyceryl alcohol; 1,2,3-Propanetriol; Trihydroxypropane	NIOSH See Appendix D OSHA† 15 mg/m ³ (total) 8 mg/m ³ (resp)	N.D.	Clear, colorless, odorless, syrupy liquid or solid (below 64°F). [Note: The solid form melts above 64°F but the liq- uid form freezes at a much lower temperature.]	MW: 92.1 BP: 554°F (Decomposes) Sol: Miscible FLP: 320°F IP: ? Sp.Gr: 1.26 Class III Combustible Liquid	VP(122°F): 0.003 mm M.L.T.: 64°F UEL: ? LEL: ?	Strong oxidizers (e.g., chromium trioxide, potassium chlorate, potassium permanganate) [Note: Hygroscopic (i.e., absorbs moisture from the air).]	Filter; none; Grav; II [Nuance Dust: #0500 (total), #0800 (resp)]
Glycidol $\text{C}_2\text{H}_4\text{O}_2$ 556-52-5 UB4375000	2,3-Epoxy-1-propanol; Epoxypyrrol alcohol; Glycidic; Hydroxymethyl ethylene oxide; 2-Hydroxymethyl oxiran; 3-Hydroxypropylene oxide	NIOSH 25 ppm (75 mg/m ³) OSHA† 50 ppm (150 mg/m ³)	150 ppm	Colorless liquid	MW: 74.1 BP: 320°F (Decomposes) Sol: Miscible FLP: 162°F IP: ? Sp.Gr: 1.12 Class IIA Combustible Liquid	VP(77°F): 0.9 mm FRZ: -49°F UEL: ? LEL: ?	Strong oxidizers, nitrates	Char; TIF GC/FID; II [#1608]
Glycolonitrile HOCH_2CN 107-16-4 AM0350000	Cyanomethanol; Formaldehyde cyanohydrin; Glycolic nitrile; Glyconitrile; Hydroxyacetonitrile	NIOSH C 2 ppm (5 mg/m ³) [5-min] OSHA none	N.D.	Colorless, odorless, oil liquid. [Note: Forms cyanide in the body.]	MW: 57.1 BP: 361°F (Decomposes) Sol: Soluble FLP: ? IP: ? Sp.Gr: 0.96°F: 1.10 Flammable Liquid	VP(145°F): 1 mm FRZ: <-86°F UEL: ? LEL: ?	Traces of alkalis (promote violent polymerization)	None available

† none = 2.37 mg/m³

Personal protection and sanitation (See Table 3)	Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
		Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 6)
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R. Provide: Eyewash, Quick drench	TBAL	Inh Abs Ing Con	Irrit eyes, skin, resp sys; derm, severe skin; cough, asthma; nau, vomit	Eye: Skin: Breath: Swallow: Irr. Immed Water wash Immed Resp support Medical attention Immed	Eyes, skin, resp sys
[Glutaraldehyde]					
Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.	TBAL	Inh Con	Irrit eyes, skin, resp sys; head, nau, vomit; kidney inj	Eye: Skin: Breath: Irr. Immed Water wash Fresh air	Eyes, skin, resp sys, kidneys
[Glycerin (misc)]					
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R.	NIOSH 160 ppm: SA/SCBAF & SCBAF-PD, PP/SAF-PD, PP-ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, skin, nose, throat, narco	Eye: Skin: Breath: Swallow: Irr. Immed Water wash prompt Resp support Medical attention Immed	Eyes, skin, resp sys, CNS
[Glycidol]					
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily Provide: Eyewash, Quick drench	NIOSH 20 ppm: SA 60 ppm: SA-CF 100 ppm: SCBAF/SAF 280 ppm: SAF-PD, PP & SCBAF-PD, PP/SAF-PD, PP-ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, skin, resp sys; head, dizz, weak, gidd, conf, convuls; dysp; abdom pain, nau, vomit	Eye: Skin: Breath: Swallow: Irr. Immed Water wash Immed Resp support Medical attention Immed	Eyes, skin, resp sys, CNS, CVS
[Glycolonitrile]					

Chemical name, structure formula, CAS and RTE CS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL, FLP, IP, Sp, Gr, Flammability	VP, FRZ, UEL, LEL		
Grain dust (oat, wheat, barley) MD7900000	None [Note: Grain dust consists of 60-75% organic materials (cereal grains) & 25-40% inorganic materials (soil), and includes fertilizers, pesticides & microorganisms.]	NIOSH 4 mg/m ³ OSHA 10 mg/m ³	N.D.	Mixture of grain and all the other substances associated with its cultivation & harvesting.	Properties depend upon the specific component of the grain dust.		None reported	Filter; none; Grav; II [#0500, Nuisance Dust (total)]
Graphite (natural) C 7782-42-5 MD9659600	Black lead, Mineral carbon, Plumbago, Silver graphite, Stove black [Note: Also see specific listing for Graphite (synthetic).]	NIOSH 2.5 mg/m ³ (resp) OSHA† 15 mppcf	1250 mg/m ³	Steel gray to black, greasy feeling, odorless solid.	MW: 12.0 BP: Sublimes Sol: Insoluble FLP: NA IP: NA Sp.Gr: 2.0-2.25 Combustible Solid	VP: 0 mm (approx) MLT: 6602°F (Sublimes) UEL: NA LEL: NA	Very strong oxidizers such as fluorine, chlorine trifluoride & potassium peroxide	Filter; none; Grav; III [Nuisance Dust; #0500 (total); #0600 (resp)]
Graphite (synthetic) C 7440-44-0 FF5250100 1362 32 (carbon, activated)	Activated carbon [Note: Also see specific listing for Graphite (natural).]	NIOSH See Appendix D OSHA† 15 mg/m ³ (total) 5 mg/m ³ (resp)	N.D.	Steel gray to black, greasy feeling, odorless solid.	MW: 12.0 BP: Sublimes Sol: Insoluble FLP: NA IP: NA Sp.Gr: 1.5-1.8 Combustible Solid	VP: 0 mm (approx) MLT: 6602°F (Sublimes) UEL: NA LEL: NA	Very strong oxidizers such as fluorine, chlorine trifluoride & potassium peroxide	Filter; none; Grav; III [Nuisance Dust; #0500 (total); #0600 (resp)]
Gypsum CaSO ₄ · 2H ₂ O 13397-24-5 MG2360000	Calcium(II) sulfate dihydrate, Gypsum stone, Hydrated calcium sulfate, Mineral white [Note: Gypsum is the dihydrate form of calcium sulfate; Plaster of Paris is the hemihydrate form.]	NIOSH 10 mg/m ³ (total) 5 mg/m ³ (resp) OSHA 15 mg/m ³ (total) 5 mg/m ³ (resp)	N.D.	White or nearly white, odorless, crystalline solid.	MW: 172.2 BP: 7 Sol(77°F): 0.2% FLP: NA IP: NA Sp.Gr: 2.32 Noncombustible Solid	VP: 0 mm (approx) MLT: 262-325°F (Loses H ₂ O) UEL: NA LEL: NA	Aluminum(at high temperatures), diazomethane	Filter; none; Grav; III [Nuisance Dust; #0500 (total); #0600 (resp)]

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)	
Skin:	N.R.	TBAL	Inh	Irritates eyes, skin, upper resp	Eye:	Irritated	Eyes, skin, resp sys
Eyes:	N.R.		Con	sys; cough, dysp, wheez, asthma, bron, chronic obstructive pulm disease; conj, dermatitis, grain fever	Breath:	Fresh air	
Wash skin:	N.R.						
Remove:	N.R.						
Change:	Daily						
[Grain dust (oat, wheat, barley)]							
Skin:	N.R.	NIOSH	Inh	Cough, dysp, black sputum, decr pulm func, lung fib	Eye:	Irritated	Resp sys, CVS
Eyes:	N.R.	12.5 mg/m ³ : D	Con		Breath:	Fresh air	
Wash skin:	N.R.	25 mg/m ³ : DXSQ/SA					
Remove:	N.R.	82.5 mg/m ³ : PAPRD/SA; CF					
Change:	N.R.	125 mg/m ³ : HIEF/PAPRTHIE/SAT; CF/SCBAF/SAF					
		1250 mg/m ³ : SAF; PD, PP					
		§: SCBAF; PD, PP/SAF; PD, PP/ASCBA					
		Escape: HIEF/SCBAE					
[Graphite (natural)]							
Skin:	N.R.	TBAL	Inh	Cough, dysp, black sputum, decr pulm func, lung fib	Eye:	Irritated	Resp sys, CVS
Eyes:	N.R.		Con		Breath:	Fresh air	
Wash skin:	N.R.						
Remove:	N.R.						
Change:	N.R.						
[Graphite (synthetic)]							
Skin:	N.R.	TBAL	Inh	Irritates eyes, skin, muc memb; upper resp sys; cough, sneez, rhin	Eye:	Irritated	Eyes, skin, resp sys
Eyes:	N.R.		Con		Breath:	Fresh air	
Wash skin:	N.R.						
Remove:	N.R.						
Change:	N.R.						
[Gypsum]							

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Hafnium Hf 7440-58-6 MG4600000 2545 40 (powder, dry) 1326 32 (powder, wet)	Cellium Elemental hafnium, Hafnium metal	NIOSH*IOSHA* 0.5 mg/m ³ [*Note: The REL and PEL also apply to other hafnium compounds (as Hf).]	50 mg/m ³ (as Hf)	Highly lustrous, ductile, grayish solid.	MW: 178.5 BP: 8316°F Sol: Insoluble Fl.P: NA IP: NA Sp Gr: 13.31 Explosive in powder form (either dry or with <25% water), finely divided powder can be ignited by static electricity or even SPONTANEOUSLY	VP: 0 mm (approx) MLT: 4041°F UEL: NA LEL: NA	Strong oxidizers, chlorine	Filter, Acid, PES, IR5) [#S194]
Haloethane CF ₃ CHBrCl 151-67-7 KH6550000	1-Bromo-1-chloro-2,2,2- trifluoroethane; 2-Bromo-2-chloro-1,1,1- trifluoroethane; 1,1,1-Trifluoro-2-bromo- 2-chloroethane; 2,2,2-Trifluoro-1-bromo- 1-chloroethane 1 ppm = 8.20 mg/m ³	NIOSH* C 2 ppm (16.2 mg/m ³) (80-min) [*Note: REL for exposure to waste anesthetic gas.] OSHA none	N.D.	Clear, colorless liquid with a sweetish, pleasant odor. [Inhalation anesthetic] [Note: May be stabilized with 0.01% thymol.]	MW: 197.4 BP: 122°F Sol: 0.3% Fl.P: NA IP: 7 Sp.Gr: 1.87 Noncombustible Liquid	VP: 243 mm FRZ: -180°F UEL: NA LEL: NA	May attack rubber & some plastics; sensitive to light.	Char.(2); CS; GC/FID; OSHA [#29]
Heptachlor C ₁₂ H ₄ Cl ₆ 76-44-8 PC0700000 2751 55 (organochlorine pesticide, solid, n.o.s.)	1,4,5,6,7,8,8-Heptachloro- 3a,4,7,7a-tetrahydro- 4,7-methanonendene	NIOSH Ca See Appendix A 0.5 mg/m ³ [skin] OSHA 0.5 mg/m ³ [skin]	Ca [35 mg/m ³]	White to light tan crystals with a camphor-like odor [insecticide]	MW: 373.4 BP: 293°F (Decomposes) Sol: 0.0005% Fl.P: NA IP: ? Sp Gr: 1.66 Noncombustible Solid, but may be dissolved in flammable liquids	VP(77°F): 0.0003 mm MLT: 203°F UEL: NA LEL: NA	Iron, rust	Chrom-102, Toluene GC/ECD, IR5) [#S287]
n-Heptane CH ₃ (CH ₂) ₅ CH ₃ 142-82-5 MI7700000 1206 27	Heptane, normal-Heptane	NIOSH 85 ppm (350 mg/m ³) C 440 ppm (1800 mg/m ³) (15-min) OSHA† 500 ppm (2000 mg/m ³)	750 ppm	Colorless liquid with a gasoline- like odor.	MW: 100.2 BP: 209°F Sol: 0.0003% Fl.P: 25°F IP: 9.90 eV Sp Gr: 0.68 Class IB Flammable Liquid	VP(72°F): 20 mm FRZ: -131°F UEL: 6.7% LEL: 1.05%	Strong oxidizers	Char. CS; GC/FID, IR [#1500 Hydro- carbons]

Personal protection and sanitation (See Table 3)	Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
		Route	Symptoms (See Table 6)	First aid (See Table 6)	Target organs (See Table 6)
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam/Daily Remove: When wet or contam Change: Daily Provide: Eyewash, Quick drench	NIOSH/OSHA 2.5 mg/m ³ DM 5 mg/m ³ DMXG/SA 12.5 mg/m ³ SA CF/PAPROM* 25 mg/m ³ H ₂ E/SAT CF/PAPRTH ₂ E/ SCBAF/SAF 50 mg/m ³ SAF/PD/PP 5 SCBAF PD/PP/SAF PD/PP ASCBA Escape: H ₂ E/SCBAE	Inh Ing Con	In animals: irrit eyes, skin, muc memb, liver damage	Eye: Skin Breath: Swallow: Imm ed Soap wash prompt Resp support Medical attention	Eyes, skin, muc memb, liver
[Methium]					
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R. Provide: Eyewash	TBAL	Inh Abs Ing Con	Intr: eyes, skin, resp sys; conf, drow, dizz, nau, analgesia, anes; card arrhy; liver, kidney damage; decr audio-visual performance; In animals: repro effects	Eye: Skin: Breath: Swallow: Imm ed Soap wash prompt Resp support Medical attention	Eyes, skin, resp sys, CVS, CNS, liver, kidneys, repro sys
[Methothane]					
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam/Daily Remove: When wet or contam Change: Daily Provide: Eyewash, Quick drench	NIOSH 5 SCBAF PD/PP/SAF PD/PP ASCBA Escape: GMFOVH ₂ E/SCBAE	Inh Abs Ing Con	In animals: tremor, convuls, liver damage, [canc]	Eye: Skin Breath: Swallow: Imm ed Soap wash imm ed Resp support Medical attention	CNS, liver [In animals: liver cancer]
[Heptachlor]					
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flamm) Change: N.R.	NIOSH 750 ppm: CCROV/GMFOV/PAPROV/SA/SCBAF 5 SCBAF PD/PP/SAF PD/PP ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Lt: head, gdd, stupor, vert, inco; loss of appetite, nau, derm, chemical pneu (asplr lq); uncon	Eye: Skin Breath: Swallow: Imm ed Soap wash prompt Resp support Medical attention	Skin, resp sys, CNS
[n-Heptane]					

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
1-Heptanethiol <chem>CH3(CH2)5SH</chem> 1539-09-4 M.J.1400000	Heptyl mercaptan, n-Heptyl mercaptan	NIOSH C 0.5 ppm (2.7 mg/m ³) [15-min] OSHA none	N.D.	Colorless liquid with a strong odor.	MW: 132.3 BP: 351°F Sol: Insoluble FLP: 115°F IP: ?	VP: ? FRZ: -46°F UEL: ? LEL: ?	Oxidizers, reducing agents, strong acids & bases, alkali metals	None available
	1 ppm = 5.50 mg/m ³				Sp.Gr: 0.84 Class II Combustible Liquid			
Hexachlorobutadiene <chem>Cl2C=CCl=CCl2</chem> 87-68-3 E.J.0700000	HCBD; Hexachloro-1,3-butadiene; 1,3-Hexachlorobutadiene; Perchlorobutadiene	NIOSH Ca See Appendix A 0.02 ppm (0.24 mg/m ³) [skin] OSHA† none	Ca [N.D.]	Clear, colorless liquid with a mild, turpentine- like odor.	MW: 280.7 BP: 419°F Sol: Insoluble FLP: ? IP: ?	VP: 0.2 mm FRZ: -4°F UEL: ? LEL: ?	Oxidizers	XAD-2; Hexane; GC/ECD; III [P&CAM #307]
	1 ppm = 10.84 mg/m ³				Sp.Gr: 1.55 Combustible Liquid			
Hexachlorocyclo- pentadiene <chem>C6Cl6</chem> 77-47-4 G.Y.1225000	HCCPD; Hexachloro-1,3-cyclo- pentadiene; 1,2,3,4,5,6-Hexachloro- 1,3-cyclopentadiene; Perchlorocyclopentadiene	NIOSH 0.01 ppm (0.1 mg/m ³) OSHA† none	N.D.	Pale-yellow to amber-colored liquid with a pungent, unpleasant odor. [Note: A solid below 16°F.]	MW: 272.8 BP: 482°F Sol(77°F): 0.0002% (Reacts) FLP: NA IP: ?	VP(77°F): 0.06 mm FRZ: 18°F UEL: NA LEL: NA	Water, light [Note: Reacts slowly with water to form hydrochloric acid; will corrode iron & most metals in presence of moisture. Explosive hydrogen gas may collect in enclosed spaces in the presence of moisture.]	Ponopak; Hexane; GC/ECD; III [#2518]
	1 ppm = 11.34 mg/m ³				Sp.Gr: 1.71 Noncombustible Liquid			
Hexachloroethane <chem>Cl6C2</chem> 67-72-1 K.I.025000	Carbon hexachloride, Ethane hexachloride, Perchloroethane	NIOSH Ca See Appendix A See Appendix C (Chloroethane) 1 ppm (10 mg/m ³) [skin] OSHA 1 ppm (10 mg/m ³) [skin]	Ca [300 ppm]	Colorless crystals with a camphor- like odor	MW 236.7 BP Sublimes Sol(72°F) 0.005% FLP: NA IP: 11.22 eV	VP 0.2 mm MLT 368°F (Sublimes) UEL: NA LEL: NA	Alkalis, metals such as zinc, cadmium, aluminum, hot iron & mercury	Char, CS, GC/FID; III [#1003, Halogen- ated Hydro- carbons]
	1 ppm = 9.84 mg/m ³				Sp.Gr: 2.09 Noncombustible Solid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)		Target organs (See Table 5)
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R.	NIOSH 5 ppm: CCROV/SA 12.5 ppm: SA-CF/PAPROV 25 ppm: CCROV/GMFOV/PAPROV/ SCBAF/SAF §: SCBAF/PD,PP/SAF/PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, skin, nose, throat; weak, cyan, incr respiration, nau, drow, head, vomit	Eye: Skin: Breath: Swallow:	Irr Irrmed Soap wash Resp support Medical attention immed	Eyes, skin, resp sys, CNS, blood
[1-Heptanethiol]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R. Eyewash, Quick drench	NIOSH §: SCBAF/PD,PP/SAF/PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	In animals: irrit eyes, skin, resp sys; kidney damage; [canc]	Eye: Skin: Breath: Swallow:	Irr Irrmed Soap wash immed Resp support Medical attention immed	Eyes, skin, resp sys, kidneys [In animals: kidney tumors]
[Hexachlorobutadiene]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R. Eyewash, Quick drench	TBAL	Inh Abs Ing Con	Irrit eyes, skin, resp sys; eye, skin burns; lac; sneez, cough, dysp, saliv, pulm edema; nau, vomit, diarr; in animals: liver, kidney inj	Eye: Skin: Breath: Swallow:	Irr Irrmed Soap flush immed Resp support Medical attention immed	Eyes, skin, resp sys, liver, kidneys
[Hexachlorocyclopentadiene]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam/Daily When wet or contam Daily Eyewash, Quick drench	NIOSH §: SCBAF/PD,PP/SAF/PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, skin, muc memb; in animals: kidney damage; [canc]	Eye: Skin: Breath: Swallow:	Irr Irrmed Soap wash immed Resp support Medical attention immed	Eyes, skin, resp sys, kidneys [In animals: liver cancer]
[Hexachloroethane]							

Chemical name, structure formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P., IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Hexachloronaphthalene $C_{10}H_2Cl_6$ 1335-87-1 QJ7350000	Halowax® 1014	NIOSH/OSHA 0.2 mg/m ³ [skin]	2 mg/m ³	White to light-yellow solid with an aromatic odor.	MW: 334.9 BP: 650-730°F Sol: Insoluble Fl.P.: NA IP: ?	VP: <1 mm MLT: 279°F UEL: NA LEL: NA	Strong oxidizers	Filter, Hexane, GC/ECD, H ₂ [#S100]
					Sp Gr: 1.78 Noncombustible Solid			
1-Hexadecanethiol $CH_3(CH_2)_{14}SH$ 2817-28-2	Cetyl mercaptan, Hexadecanethiol-1, n-Hexadecanethiol, Hexadecyl mercaptan	NIOSH C: 0.5 ppm (8.3 mg/m ³) [15-min] OSHA none	N.D.	Colorless liquid or solid (below 64-66°F) with a strong odor.	MW: 258.5 BP: ? Sol: Insoluble Fl.P.: 215°F IP: ?	VP: 0.1 mm FRZ: 64-66°F UEL: ? LEL: ?	Oxidizers, strong acids & bases, alkali metals, reducing agents	None available
	1 ppm = 10.74 mg/m ³				Sp.Gr: 0.85 Class IIB Combustible Liquid			
Hexafluoroacetone $(CF_3)_2CO$ 864-16-2 UC2450000	Hexafluoro-2-propanone; 1,1,1,3,3,3-Hexafluoro-2-propanone; HFA; Perfluoroacetone	NIOSH 0.1 ppm (0.7 mg/m ³) [skin] OSHA† none	N.D.	Colorless gas with a musty odor. [Note: Shipped as a liquefied compressed gas.]	MW: 166.0 BP: -18°F Sol: Reacts Fl.P.: NA IP: 11.81 eV	VP: 5.8 atm FRZ: -168°F UEL: NA LEL: NA	Water, acids [Note: Hygroscopic (i.e., absorbs moisture from the air); reacts with moisture to form a highly acidic sesquihydrate.]	None available
	2420 16	1 ppm = 6.90 mg/m ³			RGasD: 5.78 Nonflammable Gas, but highly reactive with water & other substances, releasing heat.			
Hexamethylene diisocyanate $OCN(CH_2)_6NCO$ 822-08-8 MO1740000	1,6-Diisocyanatohexane; HDI; Hexamethylene-1,6-diisocyanate; 1,6-Hexamethylene diisocyanate; HMDI	NIOSH 0.006 ppm (36 µg/m ³) C: 0.030 ppm (140 µg/m ³) [10-min] OSHA none	N.D.	Clear, colorless to slightly yellow liquid with a sharp, pungent odor.	MW: 168.2 BP: 415°F Sol: Low (Reacts) Fl.P.: 284°F IP: ?	VP(77°F): 0.5 mm FRZ: -68°F UEL: ? LEL: ?	Water, alcohols, strong bases, amines, carboxylic acids, organotin catalysts [Note: Reacts slowly with water to form carbon dioxide. Avoid heating above 392°F (polymerizes).]	Imp; Reagent; HPLC/UV/D; H ₂ [#5521, isocyanates]
	2261 55	1 ppm = 6.99 mg/m ³			Sp.Gr(77°F): 1.04 Class IIB Combustible Liquid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)		Target organs (See Table 8)
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Acne-form derm. nau.	Eye:	Irr immed	Skin, liver
Eyes:	Prevent eye contact	2 mg/m ³ SA*/SCBAF	Abs	conf. jaun. coma	Skin:	Soap wash prompt	
Wash skin:	When contam/Daily	5 SCBAF PD, PP/SAF PD, PP ASCBA	Ing		Breath:	Resp support	
Remove:	When wet or contam	Escape: GMFOV/SCBAE	Con		Swallow:	Medical attention immed	
Change:	Daily						
[Hexachloronaphthalene]							
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, skin, resp sys;	Eye:	Irr immed	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	5 ppm: CCROV/SA	Abs	head, dizz, weak, cyan,	Skin:	Soap wash immed	CNS, blood
Wash skin:	When contam	12.5 ppm: SA, CF/PAPROV	Ing	nau, convuls	Breath:	Resp support	
Remove:	When wet or contam	25 ppm: CCROV/GMFOV/PAPROV/SCBAF/SAF	Con		Swallow:	Medical attention immed	
Change:	Daily	4: SCBAF PD, PP/SAF PD, PP ASCBA					
		Escape: GMFOV/SCBAE					
[1-Hexadecanethiol]							
Skin:	Prevent skin contact/ Frostbite	TBAL	Inh	Irrit eyes, skin, muc memb,	Eye:	Frostbite	Eyes, skin, resp sys,
Eyes:	Prevent eye contact/ Frostbite		Abs	resp sys, pulm edema;	Skin:	Frostbite	kidneys, repro sys
Wash skin:	N.R.		Con	liq; frostbite;	Breath:	Resp support	
Remove:	N.R.			in animals: terato, repro effects, kidney inj			
Change:	N.R.						
Provide:	Frostbite						
[Hexafluoroacetone]							
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, skin, resp sys;	Eye:	Irr immed	Eyes, skin, resp sys
Eyes:	Prevent eye contact	0.05 ppm: SA*	Ing	cough, dysp, bron, wheez,	Skin:	Soap flush immed	
Wash skin:	When contam	0.125 ppm: SA, CF*	Con	pulm edema, asthma; com	Breath:	Resp support	
Remove:	When wet or contam	0.25 ppm: SCBAF/SAF		damage, skin blisters	Swallow:	Medical attention immed	
Change:	N.R.	1 ppm: SAF PD, PP					
Provide:	Eyewash, Quick drench	4: SCBAF PD, PP/SAF PD, PP ASCBA					
		Escape: GMFOV/SCBAE					
[Hexamethylene diisocyanate]							

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL, F.P., IP, Sp. Gr, flammability	VP, FRZ UEL, LEL		
Hexamethyl phosphoramide $[(CH_3)_6N]_4PO$ 680-31-9 TD0875000	Hexamethylphosphoric triamide, Hexamethylphosphoro- triamide, HMPA, Tris(dimethylamino)- phosphine oxide	NIOSH Ca See Appendix A OSHA none	N.D.	Clear, colorless liquid with an aromatic or mild, amine-like odor. [Note: A solid below 43°F.]	MW: 178.2 BP: 461°F Sol: Miscible F.P.: 222°F IP: 7	VP: 0.03 mm FRZ: 43°F UEL: 7 LEL: 7	Oxidizers, strong acids, chemically active metals (e.g., potassium, sodium, magnesium, zinc)	None available
	1 ppm = 7.46 mg/m ³				Sp. Gr: 1.03 Class IIB Combustible Liquid			
n-Hexane $CH_3(CH_2)_4CH_3$ 110-54-3 MN9275000	Hexane, Hexyl hydride, normal-Hexane	NIOSH 50 ppm (180 mg/m ³) OSHA† 500 ppm (1800 mg/m ³)	1100 ppm [LEL]	Colorless liquid with a gasoline- like odor.	MW: 86.2 BP: 156°F Sol: 0.002% F.P. -7°F IP: 10 to 18 eV	VP: 124 mm FRZ: -219°F UEL: 7.5% LEL: 1.1%	Strong oxidizers	Char. CS, GCFIO, III [#1500, Hydro- carbons]
1208 27	1 ppm = 3.58 mg/m ³				Sp. Gr: 0.66 Class IB Flammable Liquid			
Hexane isomers (excluding n-Hexane) C_6H_{14}	Diethylmethylmethane; Diisopropyl; 2,2-Dimethylbutane; 2,3-Dimethylbutane; isohexane; 2-Methylpentane; 3-Methylpentane; [Note: Also see specific listing for n-Hexane.]	NIOSH 100 ppm (350 mg/m ³) C 510 ppm (1800 mg/m ³) [15-min] OSHA† none	N.D.	Clear liquids with mild, gasoline-like odors. [Note: Includes all the isomers of hexane except n-hexane.]	MW: 86.2 BP: 122-145°F Sol: Insoluble F.P.: -54 to 19°F IP: 7	VP: 7 FRZ: -245 to -148°F UEL: 7 LEL: 7	Strong oxidizers	None available
1208 27	1 ppm = 3.58 mg/m ³				Sp. Gr: 0.65-0.68 Class IB Flammable Liquids			
n-Hexanethiol $CH_3(CH_2)_4SH$ 111-31-9 MO4650000	1-Hexanethiol, Hexyl mercaptan, n-Hexyl mercaptan, n-Hexylthiol	NIOSH C 0.6 ppm (2.7 mg/m ³) [15-min] OSHA none	N.D.	Colorless liquid with an unpleasant odor.	MW: 118.2 BP: 304°F Sol: Insoluble F.P.: 68°F IP: 7	VP: 7 FRZ: -113°F UEL: 7 LEL: 7	Oxidizers, reducing agents, strong acids & bases, alkali metals	None available
	1 ppm = 4.91 mg/m ³				Sp. Gr: 0.84 Class IB Flammable Liquid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 6)
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R. Eyewash, Quick drench	NIOSH 1: SCBAF:PD,PP/SAF:PD,PP/ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, skin, resp sys; dysp; abdom pain; [canc]	Eyes: Skin: Breath: Swallow:	Irritated Water flush Resp support Medical attention Irritated Eyes, skin, resp sys, CNS, GI tract [In animals: cancer of the nasal cavity]
[Hexamethyl phosphoramide]						
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet (flam) N.R.	NIOSH 500 ppm: SA* 1100 ppm: SA:CF/SCBAF/SAF § SCBAF:PD,PP/SAF:PD,PP/ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, nose, h-head, neu, head; perit neur numb extremities, musc weak derm; gidd, chemical pneu (aspir liq)	Eyes: Skin: Breath: Swallow:	Irritated Soap wash Resp support Medical attention Irritated Eyes, skin, resp sys, CNS, PNS
[n-Hexane]						
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet (flam) N.R.	NIOSH 1000 ppm: SA* 2500 ppm: SA:CF* 6000 ppm: SA:CF/SCBAF/SAF § SCBAF:PD,PP/SAF:PD,PP/ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, skin, resp sys; head, gidd, dizz, h-head; neu; chemical pneu (aspir liq); derm	Eyes: Skin: Breath: Swallow:	Irritated Soap wash Resp support Medical attention Irritated Eyes, skin, resp sys, CNS
[Hexane isomers (excluding n-Hexane)]						
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet (flam) N.R.	NIOSH 5 ppm: CCROV/SA 12.5 ppm: SA:CF/PAPROV 25 ppm: CCRFOV/GMFOV/PAPROV/ SCBAF/SAF § SCBAF:PD,PP/SAF:PD,PP/ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, skin, nose, throat; weak, cyan, incr respiration, nau, drow, head, vomit	Eyes: Skin: Breath: Swallow:	Irritated Soap wash Resp support Medical attention Irritated Eyes, skin, resp sys, CNS, blood
[n-Hexa methiol]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P, IP, Sp, Gr, Flammability	VP, FRZ UEL, LEL		
2-Hexanone <chem>CH3CO(CH2)3CH3</chem> 591-78-6 MP1400000	Butyl methyl ketone, MBK, Methyl butyl ketone, Methyl n-butyl ketone	NIOSH 1 ppm (4 mg/m ³) OSHA† 100 ppm (410 mg/m ³)	1800 ppm	Colorless liquid with an acetone- like odor	MW 100.2 BP 262°F Sol: 2% Fl.P 77°F IP 9.34 eV	VP 11 mm FRZ -71°F UEL 8% LEL ?	Strong oxidizers	Char, CS, GC/FID, III (#1300, Ketones I)
	1 ppm = 4.17 mg/m ³				Sp Gr 0.81 Class IC Flammable Liquid			
Hexone <chem>CH3COCH2CH(CH3)2</chem> 108-10-1 SA9275000	Isobutyl methyl ketone, Methyl isobutyl ketone, 4-Methyl-2-pentanone, MIBK	NIOSH 50 ppm (205 mg/m ³) ST 75 ppm (300 mg/m ³) OSHA† 100 ppm (410 mg/m ³)	500 ppm	Colorless liquid with a pleasant odor	MW 100.2 BP 242°F Sol: 2% Fl.P 64°F IP 9.30 eV	VP 16 mm FRZ -120°F UEL (200°F) 8.0% LEL (200°F) 1.2%	Strong oxidizers, potassium tert- butoxide	Char, CS, GC/FID, III (#1300, Ketones I)
1245-26	1 ppm = 4.17 mg/m ³				Sp Gr 0.80 Class IB Flammable Liquid			
sec-Hexyl acetate <chem>C6H12O2</chem> 108-84-9 SA7525000	1,3-Dimethylbutyl acetate, Methylisobutyl acetate <chem>[CH3]COOCH2CH(CH3)CH2CH(CH3)2</chem>	NIOSH/OSHA 50 ppm (300 mg/m ³)	500 ppm	Colorless liquid with a mild, pleasant, fruity odor	MW 144.2 BP 297°F Sol: 0.08% Fl.P 113°F IP ?	VP 3 mm FRZ -83°F UEL ? LEL ?	Nitrates, strong oxidizers, alkalis & acids	Char, CS, GC/FID, III (#1450, Esters I)
1233-26	1 ppm = 5.95 mg/m ³				Sp Gr 0.86 Class II Combustible Liquid			
Hexylene glycol <chem>[CH2]2COHCH2CHONCH2</chem> 107-61-6 SA6810000	2,4-Dihydroxy-2-methyl- pentane, 2-Methyl-2,4-pentanediol; 4-Methyl-2,4-pentanediol; 2-Methylpentane-2,4-diol	NIOSH C 28 ppm (128 mg/m ³) OSHA† none	N.D.	Colorless liquid with a mild, sweetish odor.	MW: 118.2 BP: 385°F Sol: Miscible Fl.P: 209°F IP: ?	VP: 0.05 mm FRZ: -54°F (Sets to glass) UEL(test): 7.4% LEL(calc): 1.3%	Strong oxidizers, strong acids [Note: Hygroscopic (i.e., absorbs moisture from the air).]	None available
					Sp Gr: 0.92 Class II Combustible Liquid			

† OSHA 1910.106 (b)(6)

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection – maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 6)	First aid (See Table 6)	Target organs (See Table 6)
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet (flamm) N.R.	NIOSH 10 ppm: SA 25 ppm: SA CF 50 ppm: SAT CF/SCBAF/SAF 1600 ppm: SAF/PD,PP § SCBAF PD,PP/SAF PD,PP ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irr: eyes, nose per: neur. weak, pares; derm, head, drow	Eye: Skin: Breath: Swallow: Irr: immed Soap wash immed Resp support Medical attention immed	Eyes, skin, resp sys, CNS, PNS
[2-Hexanone]						
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet (flamm) N.R.	NIOSH 500 ppm: CCROV*/GMFOV/PAPROV*/ SA*/SCBAF § SCBAF PD,PP/SAF PD,PP ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irr: eyes, skin, muc memb, head, narco, coma, derm, In animals: liver, kidney damage	Eye: Skin: Breath: Swallow: Irr: immed Water flush prompt Resp support Medical attention immed	Eyes, skin, resp sys CNS: liver, kidneys
[Hexone]						
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R.	NIOSH/OSHA 500 ppm: CCROV*/GMFOV/PAPROV*/ SA*/SCBAF § SCBAF PD,PP/SAF PD,PP ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irr: eyes, skin, nose, throat, head In animals: narco	Eye: Skin: Breath: Swallow: Irr: immed Water flush prompt Resp support Medical attention immed	Eyes, skin, resp sys, CNS
[sec-Hexyl acetate]						
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R. Eyewash	TBAL	Inh Ing Con	Irr: eyes, skin, resp sys; head, dizz, nau, inco, CNS depress; derm, skin sens	Eye: Skin: Breath: Swallow: Irr: immed Water wash immed Resp support Medical attention immed	Eyes, skin, resp sys, CNS
[Hexylene glycol]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Hydrazine H_2NNH_2 302-01-2 MIU175000	Diamine, Hydrazine (anhydrous), Hydrazine base	NIOSH Ca See Appendix A C 0.03 ppm (0.04 mg/m ³) (2-hr) OSHA† 1 ppm (1.3 mg/m ³) [skin]	Ca [50 ppm]	Colorless, fuming, oily liquid with an ammonia-like odor. [Note: A solid below 36°F.]	MW: 32.1 BP: 236°F Sol: Miscible FLP: 99°F IP: 8.93 eV	VP: 10 mm FRZ: 36°F UEL: 96% LEL: 2.9%	Oxidizers, hydrogen peroxide, nitric acid, metallic oxides/acids [Note: Can ignite SPONTANEOUSLY on contact with oxidizers or porous materials such as earth, wood & cloth.]	Bub. Reagent, Vis; IR [#3503]
2030 59 (64% soln.) 2029 28 (>64% soln.)	1 ppm = 1.33 mg/m ³				Sp Gr: 1.01 Class IC Flammable Liquid			
Hydrogenated terphenyls ($\text{C}_{18}\text{H}_{14}$) 61788-32-7 WZ6535000	Hydrogenated diphenyl- benzenes, Hydrogenated phenyl- biphenyls, Hydrogenated triphenyls [Note: Complex mixture of terphenyl isomers that are partially hydrogenated.]	NIOSH 0.5 ppm (5 mg/m ³) OSHA† none	N.D.	Clear, oily, pale- yellow liquids with a faint odor, [plasticizer/heat transfer media]	MW: 298 (40% hydro- genated) BP: 644°F (40%) Sol: Insoluble FLP: 315°F (40%) IP: ?	VP(77°F): 0.1 mm (40%) FRZ: ? UEL: ? LEL: ?	None reported [Note: When heated, irritating vapors will be released.]	None available
	1 ppm = 12.39 mg/m ³ (40% hydrogenated)				Sp. Gr(77°F): 1.003-1.009 (40% hydrogenated) Class IIIB Combustible Liquids			
Hydrogen bromide HBr 10035-10-6 MW3850000	Anhydrous hydrogen bromide, Aqueous hydrogen bromide (i.e., Hydrobromic acid)	NIOSH C 3 ppm (10 mg/m ³) OSHA† 3 ppm (10 mg/m ³)	30 ppm	Colorless gas with a sharp, irritating odor. [Note: Shipped as a liquefied compressed gas. Often used in an aqueous solution.]	MW: 80.9 BP: -88°F Sol: 49% FLP: NA IP: 11.62 eV	VP: 20 atm FRZ: -124°F UEL: NA LEL: NA	Strong oxidizers, strong caustics, moisture, copper, brass, zinc [Note: Hydrobromic acid is highly corrosive to most metals.]	Si gel, NaHCO ₃ / Na ₂ CO ₃ , IC, IR [#7903, Inorganic Acids]
1048 15 (anhydrous) 1788 60 (solution)	1 ppm = 3.36 mg/m ³				RGasD: 2.81 Nonflammable Gas			
Hydrogen chloride HCl 7647-01-0 MW4025000	Anhydrous hydrogen chloride; Aqueous hydrogen chloride (i.e., Hydrochloric acid, Muriatic acid) [Note: Often used in an aqueous solution.]	NIOSH/OSHA C 5 ppm (7 mg/m ³)	50 ppm	Colorless to slightly yellow gas with a pungent, irritating odor. [Note: Shipped as a liquefied compressed gas.]	MW: 36.5 BP: -121°F Sol: 66°F: 67% FLP: NA IP: 12.74 eV	VP: 40.5 atm FRZ: -174°F UEL: NA LEL: NA	Hydroxides, amines, alkalis, copper, brass, zinc [Note: Hydrochloric acid is highly corrosive to most metals.]	Si gel, NaHCO ₃ / Na ₂ CO ₃ , IC, IR [#7903, Inorganic Acids]
1050 15 (anhydrous) 1789 60 (solution)	1 ppm = 1.52 mg/m ³				RGasD: 1.27 Nonflammable Gas			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)	
Skin:	Prevent skin contact	NIOSH § SCBAF PD PP/SAF PD,PP ASCBA Escape SCBAE	Inh Abs Inj Con	Irr: eyes, skin, nose, throat; temporary blindness; dizz, nau, derm, eye, skin burns in animals: bron, pulm edema, liver, kidney damage, convuls. (card)	Eye: Skin: Breath: Swallow:	Irr: Immed Water flush Immed Resp. support Medical attention Immed	Eyes, skin, resp sys CNS, liver, kidneys [in animals: tumors of the lungs, liver, blood vessels & intestine]
Eyes:	Prevent eye contact						
Wash skin:	When contam						
Remove:	When wet (flam)						
Change:	N.R.						
Provide:	Eyewash, Quick drench						
[Hydrazine]							
Skin:	Prevent skin contact	TBAL	Inh Inj Con	Irr: eyes, skin, resp sys; liver, kidney, hemato damage	Eye: Skin: Breath: Swallow:	Irr: Immed Soap wash Immed Resp support Medical attention Immed	Eyes, skin, resp sys, liver, kidneys, hemato sys
Eyes:	Prevent eye contact						
Wash skin:	When contam						
Remove:	When wet or contam						
Change:	Daily						
[Hydrogenated terphenyls]							
Skin:	Prevent skin contact (soln)/Frostbite	NIOSH/OSHA 30 ppm: SA/CF/PAPRAG/GMFAG/ SCBAF/SAF § SCBAF PD PP/SAF PD,PP ASCBA Escape GMFAG/SCBAE	Inh Inj (soln) Con	Irr: eyes, skin, nose, throat; soln: eye, skin burns, liq: frostbite	Eye: Skin: Breath: Swallow:	Irr: Immed (soln)/ Frostbite Water flush Immed (soln)/Frostbite Resp. support Medical attention Immed (soln)	Eyes, skin, resp sys
Eyes:	Prevent eye contact (soln)/Frostbite						
Wash skin:	When contam (soln)						
Remove:	When wet or contam (soln)						
Change:	N.R.						
Provide:	Eyewash (soln), Quick drench (soln), Frostbite						
[Hydrogen bromide]							
Skin:	Prevent skin contact (soln)/ Frostbite	NIOSH/OSHA 60 ppm: CCRS*/GMFS/PAPRS*/ SA*/SCBAF § SCBAF PD,PP/SAF PD,PP ASCBA Escape: GMFAG/SCBAE	Inh Inj (soln) Con	Irr: nose, throat, larynx; cough, choking, derm, soln: eye, skin burns, liq: frostbite; in animals: lar spasm, pulm edema	Eye: Skin: Breath: Swallow:	Irr: Immed (soln)/ Frostbite Water flush Immed (soln)/Frostbite Resp. support Medical attention Immed (soln)	Eyes, skin, resp sys
Eyes:	Prevent eye contact/Frostbite						
Wash skin:	When contam (soln)						
Remove:	When wet or contam						
Change:	N.R.						
Provide:	Eyewash (soln), Quick drench (soln), Frostbite						
[Hydrogen chloride]							

Chemical name, structure/formula, CAS and RTECS Nos., and DOTID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL F.P., IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Hydrogen cyanide HCN 74-90-8 MW5825000	Formonitrile, Hydrocyanic acid, Prussic acid	NIOSH ST 4.7 ppm (5 mg/m ³) [skin] OSHA† 10 ppm (11 mg/m ³) [skin]	50 ppm	Colorless or pale-blue liquid or gas (above 78°F) with a bitter, almond-like odor [Note: Often used as a 96% solution in water.]	MW 27.0 BP -78°F (96%) Sol Miscible F.P. 0°F (96%) IP 13.60 eV Sp Gr 0.69 Class IA Flammable Liquid Flammable Gas	VP 630 mm FRZ 7°F (96%) UEL 40.0% LEL 5.6%	Amines, oxidizers, acids, sodium hydroxide, calcium hydroxide, sodium carbonate, water, caustics, ammonia [Note: Can polymerize at 122-140°F.]	Soda lime, Water, Vis. III [#6010]
Hydrogen fluoride (as F) HF 7664-39-3 MW7875000	Anhydrous hydrogen fluoride, Aqueous hydrogen fluoride (i.e., Hydrofluoric acid), HF-A	NIOSH 3 ppm (2.5 mg/m ³) C 6 ppm (5 mg/m ³) [15-min] OSHA† 3 ppm	30 ppm	Colorless gas or fuming liquid (below 67°F) with a strong, irritating odor [Note: Shipped in cylinders.]	MW 20.0 BP 67°F Sol Miscible F.P. NA IP 15.98 eV RGasD: 1.86 Sp Gr 1.00 (Liquid at 67°F) Nonflammable Gas	VP 783 mm FRZ -118°F UEL NA LEL NA	Metals, water or steam [Note: Corrosive to metals. Will attack glass and concrete.]	Si gel*, NaHCO ₃ , Na ₂ CO ₃ , IC, III [#7903, Inorganic Acids] [Also #7902.]
Hydrogen peroxide H ₂ O ₂ 7722-84-1 MX0900000	High-strength hydrogen peroxide, Hydrogen dioxide, Hydroperoxide (aqueous), Hydroperoxide, Peroxide	NIOSH/OSHA 1 ppm (1.4 mg/m ³)	75 ppm	Colorless liquid with a slightly sharp odor [Note: The pure compound is a crystalline solid below 12°F. Often used in an aqueous solution.]	MW 34.0 BP 286°F Sol Miscible F.P. NA IP 10.54 eV Sp Gr 1.39 Noncombustible Liquid, but a powerful oxidizer	VP(86°F): 5mm FRZ 12°F UEL NA LEL NA	Oxidizable materials, iron, copper, brass, bronze, chromium, zinc, lead, silver, manganese [Note: Contact with combustible material may result in SPONTANEOUS combustion.]	None available
Hydrogen selenide (as Se) H ₂ Se 7783-07-5 MX1050000	Selenium dihydride, Selenium hydride	NIOSH/OSHA 0.05 ppm (0.2 mg/m ³)	1 ppm	Colorless gas with an odor resembling decayed horse radish [Note: Shipped as a liquefied compressed gas.]	MW 81.0 BP -42°F Sol(73°F) 0.0% F.P. NA (Gas) IP 9.88 eV RGasD: 2.80 Flammable Gas	VP(70°F): 9.5 atm FRZ -87°F UEL ? LEL ?	Strong oxidizers, acids, water, halogenated hydrocarbons	None available
2202 13 (anhydrous)	1 ppm = 3.37 mg/m ³							

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	Prevent skin contact	NIOSH	Inh	Asphy, weak, head, conf,	Eye:	CNS, CVS, thyroid, blood
Eyes:	Prevent eye contact	47 ppm SA	Ab	neu, vomit, incr rate and	Skin:	
Wash skin:	When contam	50 ppm SA CF/SCBAF/SAF	Ing	depth of respiration or	Breath:	
Remove:	When wet (flam)	5 SCBAF PD, PP/SAF PD, PP ASCBA	Con	respiration slow and	Swallow:	
Change:	N.R.	Escape GMFS/SCBAE		gaspng, thyroid, blood changes		
Provide:	Eyewash, Quick drench					
[Hydrogen cyanide]						
Skin:	Prevent skin contact (liq)	NIOSH/OSHA	Inh	Irrt eyes, skin, nose,	Eye:	Eyes, skin, resp sys, bones
Eyes:	Prevent eye contact (liq)	30 ppm CCRS*/PAPRS*/GMFS/	Ab	throat, pulm edema, eye,	Skin:	
Wash skin:	When contam (liq)	SA*/SCBAF	(liq)	skin burns, rhinitis; bron	Breath:	
Remove:	When wet or contam (liq)	5 SCBAF PD, PP/SAF PD, PP ASCBA	Ing	bone changes	Swallow:	
Change:	N.R.	Escape GMFS/SCBAE	Con			
Provide:	Eyewash (liq), Quick drench (liq)					
[Hydrogen fluoride (as F)]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrt eyes, nose, throat;	Eye:	Eyes, skin, resp sys
Eyes:	Prevent eye contact	10 ppm SA*	Ing	cont ulcer, eryt, vesic	Skin:	
Wash skin:	When contam	25 ppm SA CF*	Con	skin; bleaching hair	Breath:	
Remove:	When wet or contam	50 ppm SCBAF/SAF			Swallow:	
Change:	N.R.	75 ppm SAF PD, PP				
Provide:	Eyewash, Quick drench	5 SCBAF PD, PP/SAF PD, PP ASCBA				
		Escape GMFS/SCBAE				
[Hydrogen peroxide]						
Skin:	Frostbite	NIOSH/OSHA	Inh	Irrt eyes, nose, throat;	Eye:	Eyes, resp sys, liver
Eyes:	Frostbite	0.5 ppm SA	Con	neu, vomit, diarr; metallic	Skin:	
Wash skin:	N.R.	1 ppm SA CF*/SCBAF/SAF		taste, garlic breath, dizz,	Breath:	
Remove:	When wet (flam)	5 SCBAF PD, PP/SAF PD, PP ASCBA		less, flq, liq; frostbite;		
Change:	N.R.	Escape GMFS/SCBAE		in animals: pneumonia, liver damage		
Provide:	Frostbite					
[Hydrogen selenide (as Se)]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TLV unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL, FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Hydrogen sulfide H_2S 7783-06-4 MX1225000	Hydro-sulfuric acid, Sewer gas Sulfurated hydrogen	NIOSH C 10 ppm (15 mg/m ³) [10-min] OSHA† C 20 ppm 50 ppm (10-min max peak)	100 ppm	Colorless gas with a strong odor of rotten eggs [Note: Sense of smell becomes rapidly fatigued & can NOT be relied upon to warn of the continuous presence of H_2S . Shipped as a liquefied compressed gas.]	MW: 34.1 BP: -77°F Sol: 0.4% FLP: NA (Gas) IP: 10.46 eV	VP: 17.8 atm FRZ: -122°F UEL: 44.0% LEL: 4.0%	Strong oxidizers, strong min. acid, metals	Cher: NH_4OH/H_2O_2 IC: II [#6013]
1053 13	1 ppm = 1.42 mg/m ³					RGasD: 1.19 Flammable Gas		
Hydroquinone $C_6H_4(OH)_2$ 123-31-9 MX3500000	p-Benzenediol; 1,4-Benzenediol; Dihydroxybenzene 1,4-Dihydroxybenzene, Quinol	NIOSH C 2 mg/m ³ [15-min] OSHA 2 mg/m ³	50 mg/m ³	Light-tan, light- gray, or colorless crystals	MW: 110.1 BP: 545°F Sol: 7% FLP: 329°F (Molten) IP: 7.95 eV Sp Gr: 1.33 Combustible Solid; dust cloud may explode if ignited in an enclosed area	VP: 0.00001 mm MLT: 338°F UEL: ? LEL: ?	Strong oxidizers, alkali	Filter: CH_3COOH HPLC/UVD III [#5004]
2562 53								
2-Hydroxypropyl acrylate $CH_2=CHOOCH_2CH(OH)CH_3$ 999-61-1 AT1925000	HPA, 8-Hydroxypropyl acrylate, Propylene glycol monoacrylate	NIOSH 0.8 ppm (3 mg/m ³) [skin] OSHA† none	N.D.	Clear to light- yellow liquid with a sweetish, solvent odor.	MW: 130.2 BP: 376°F Sol: ? FLP: 149°F IP: ? Sp Gr: 1.05 Class IIIA Combustible Liquid	VP: ? FRZ: ? UEL: ? LEL: 1.8%	Water [Note: Can become unstable at high temperatures & pressures or may react with water with some release of energy, but not violently.]	None available
1 ppm = 6.41 mg/m ³								
Indene C_9H_8 95-13-6 NK8226000	Indonaphthene	NIOSH 10 ppm (45 mg/m ³) OSHA† none	N.D.	Colorless liquid. [Note: A solid below 29°F.]	MW: 116.2 BP: 359°F Sol: insoluble FLP: 173°F IP: 8.81 eV Sp Gr: 0.987 Class IIIA Combustible Liquid	VP: ? FRZ: 29°F UEL: ? LEL: ?	None reported [Note: Polymerizes & oxidizes on standing. It has exploded during nitration with ($H_2SO_4 + HNO_3$).]	None available
1 ppm = 4.83 mg/m ³								

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)	
Skin: Eyes: Wash skin: Remove: Change: Provide:	Frostbite Frostbite N.R. When wet (flammi) N.R. Frostbite	NIOSH 100 ppm PAPRS/GMFS/SA*/SCBAF § SCBAF PD, PP/SAF PD, PP ASCBA Escape GMFS/SCBAE	Inh Con	Irrit eyes, resp sys, apnea, coma, convuls, cony, eye pain, lac, photo, corn vesic, dizz, head, fig uriny, insom, GI dist	Eye: Skin: Breath:	Frostbite Frostbite Resp support	Eyes, resp sys, CNS
[Hydrogen sulfide]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam Daily Eyewash (>7%)	NIOSH/OSHA 50 mg/m ³ : PAPRD/HIEF/SAT:CF/ SCBAF/SAF § SCBAF PD, PP/SAF PD, PP ASCBA Escape HIEF/SCBAE	Inh Ing Con	Irrit eyes, cony, kera, CNS excitement, colored urine, nau, dizz, suffocation, rapid breath, musc twitch, delirium, collapse, skin irrit, asea, derm	Eye Skin Breath Swallow:	Irritated Water flush Resp support Medical attention Irritated	Eyes, skin, resp sys, CNS
[Hydroquinone]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R. Eyewash, Quick drench	TBAL	Inh Abs Ing Con	Irrit eyes, skin, resp sys; eye, skin burns; cough, dysp	Eye: Skin: Breath: Swallow:	Irritated Soap flush Irritated Resp support Medical attention Irritated	Eyes, skin, resp sys
[2-Hydroxypropyl acrylate]							
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact Daily When wet or contam N.R.	TBAL	Inh Ing Con	In animals: Irrit eyes, skin, muc memb; derm, skin sore; chemical pneu (aspir liq); liver, kidney, spleen inj	Eye: Skin: Breath: Swallow:	Irritated Soap wash Resp support Medical attention Irritated	Eyes, skin, resp sys, liver, kidneys, spleen
[Indene]							

Chemical name, structure formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL F.P., IP, Sp. Gr., flammability	VP, FRZ UEL, LEL		
Indium In 7440-74-8 NL1060000	Indium metal	NIOSH: 0.1 mg/m ³ [Note: The REL also applies to other indium compounds (as In).] OSHA† none	N.D.	Ductile, shiny, silver-white metal that is softer than lead.	MW: 114.8 BP: 3787°F Sol: Insoluble F.P.: NA IP: NA Sp.Gr: 7.31 Noncombustible Solid in bulk form, but may ignite in powdered or dust form.	VP: 0 mm (approx) MLT: 314°F UEL: NA LEL: NA	(Dinitrogen tetroxide + acetonitrile), mercury(II) bromide (at 662°F), sulfur (mixtures ignite when heated) [Note: oxidizes readily at higher temperatures.]	Filter; Acid; AA; R(9) [P&CAM #173]
Iodine 7553-56-2 NN1575000	Iodine crystals, Molecular iodine	NIOSH/OSHA C 0.1 ppm (1 mg/m ³)	2 ppm	Violet solid with a sharp characteristic odor.	MW: 253.8 BP: 365°F Sol: 0.01% F.P.: NA IP: 9.31 eV	VP: (77°F): 0.3 mm MLT: 236°F UEL: NA LEL: NA	Ammonia, acetylene, acetaldehyde, powdered aluminum, active metals, liquid chlorine	Char* Na ₂ CO ₃ IC: III [#6005]
	1 ppm = 10.55 mg/m ³				Sp. Gr: 4.93 Noncombustible Solid			
Iodoform CHI ₃ 75-47-8 PB7000000	Triiodomethane	NIOSH 9.8 ppm (10 mg/m ³) OSHA† none	N.D.	Yellow to greenish- yellow powder or crystalline solid with a pungent, disagreeable odor. [antiseptic for external use]	MW: 393.7 BP: 410°F (Decomposes) Sol: 0.01% F.P.: NA IP: ? Sp. Gr: 4.01 Noncombustible Solid	VP: ? MLT: 246°F UEL: NA LEL: NA	Strong oxidizers, ethium, metallic salts (e.g., mercuric oxide, silver nitrate), strong bases, calomel, tannin	None available
	1 ppm = 18.34 mg/m ³							
Iron oxide dust and fume (as Fe) Fe ₂ O ₃ 1309-37-1 NO7400000 NO7525000 (fume) 1376 37	Ferric oxide, Iron(III) oxide	NIOSH 5 mg/m ³ OSHA 10 mg/m ³	2600 mg/m ³ (as Fe)	Reddish-brown solid [Note: Exposure to fume may occur during the arc-welding of iron.]	MW: 159.7 BP: ? Sol: Insoluble F.P.: NA IP: NA Sp. Gr: 5.24 Noncombustible Solid	VP: 0 mm (approx) MLT: 2564°F UEL: NA LEL: NA	Calcium hypochlorite	Filter; none; XRF; II [#7200, Welding & Brazing Fume]

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin: Eyes: Wash skin: Remove: Change:	N.R. N.R. N.R. N.R. N.R.	TBAL	Inh Ing Con	Irrit eyes, skin, resp sys; possible liver, kidney, heart, blood effects; pulm edema	Eye: Skin: Breath: Swallow: Inn: Immed Soap wash Resp support Medical attention Immed	Eyes, skin, resp sys, liver, kidneys, heart, blood
[Indium]						
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam Daily Eyewash (>7%), Quick drench (>7%)	NIOSH/OSHA 1 ppm: SA* 2 ppm: SA; CF*/SCBAF/SAF § SCBAF PD PP/SAF PD PP ASCBA Escape: GMFAGHIE/SCBAE	Inh Ing Con	Irrit eyes, skin, nose, lac. head, chest tight; skin burns, rash, cutaneous hypersensitivity	Eye: Skin: Breath: Swallow: Inn: Immed Soap wash Immed Resp support Medical attention Immed	Eyes, skin, resp sys, CNS, CVS
[Iodine]						
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet or contam Daily	TBAL	Inh Abs Ing Con	Irrit eyes, skin; ill-head, dizz, nau, inco, CNS depress; dysp; liver, kidney, heart damage; via diet	Eye: Skin: Breath: Swallow: Inn: Immed Soap wash Immed Resp support Medical attention Immed	Eyes, skin, resp sys, liver, kidneys, heart
[Iodoform]						
Skin: Eyes: Wash skin: Remove: Change:	N.R. N.R. N.R. N.R. N.R.	NIOSH 50 mg/m ³ DMFw/SA 125 mg/m ³ SA; CF/PAPRDMFu 250 mg/m ³ HIEF/SAT CF/PAPRTHIE/ SCBAF/SAF 2500 mg/m ³ : SA; PD, PP § SCBAF PD, PP/SAF PD, PP ASCBA Escape: HIEF/SCBAE	Inh	Benign pneumoconiosis with X-ray shadows indistinguishable from fibrotic pneumoconiosis (siderosis)	Breath: Resp support	Resp sys
[Iron oxide dust and fume (as Fe)]						

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 6)
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flam) Change: N.R. Provide: Quick drench		TBAL	Inh Abs Ing Con	Irrit eyes, muc memb, resp sys; head, dizz, nau, vomit; fever, cyan, cough, dysp; liver, kidney, lung inj; degenerative changes in CNS	Eye: Irr Skin: Irr Breath: Irr Swallow: Irr	Eyes, resp sys, CNS, liver, kidneys Soap flush Resp support Medical attention Irrimed
[Iron pentacarbonyl (as Fe)]						
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: Daily Remove: N.R. Change: Daily		TBAL	Inh Ing Con	Irrit eyes, skin, muc memb; abdom pain, diarr, vomit; possible liver damage	Eye: Irr Skin: Irr Breath: Irr Swallow: Irr	Eyes, skin, resp sys, liver, GI tract Soap wash Resp support Medical attention Irrimed
[Iron salts (soluble, as Fe)]						
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flam) Change: N.R.		NIOSH/OSHA 1000 ppm: CCROV//PAPROV/GMFOV/ SA/SCBAF § SCBAF PD, PP/SAF PD, PP ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, skin, nose, throat, derm, in animals: narco	Eye: Irr Skin: Irr Breath: Irr Swallow: Irr	Eyes, skin, resp sys, CNS Water flush prompt Resp support Medical attention Irrimed
[Isocetyl acetate]						
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R.		NIOSH/OSHA 600 ppm: SA:CF//CCRFOV/GMFOV/ PAPROV/SCBAF/SAF § SCBAF PD, PP/SAF PD, PP ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, skin, nose, throat, head, dizz, cough, dysp, nau, vomit, diarr, skin cracking, in animals: narco	Eye: Irr Skin: Irr Breath: Irr Swallow: Irr	Eyes, skin, resp sys, CNS Water flush prompt Resp support Medical attention Irrimed
[Isocetyl alcohol (primary)]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp. Gr., flammability	VP, FRZ UEL, LEL		
Isomyl alcohol (secondary) $(\text{CH}_3)_2\text{CHCH}_2\text{OH}(\text{CH}_2)_2$ 528-75-4	3-Methyl-2-butanol, Secondary isomyl alcohol	NIOSH 100 ppm (360 mg/m ³) ST 125 ppm (450 mg/m ³) OSHA† 100 ppm (360 mg/m ³)	500 ppm	Colorless liquid with a disagreeable odor.	MW: 88.2 BP: 234°F Sol: ? Fl P (oc): 95°F IP: ?	VP: 1 mm FRZ: ? UEL: ? LEL: ?	Strong oxidizers	Char; 2-Propanol/ CS; GC/FID; IR [§1402, Alcohols III]
1105 26	1 ppm = 3.67 mg/m ³				Sp. Gr: 0.82 Class IC Flammable Liquid			
Isobutane $\text{CH}_3\text{CH}(\text{CH}_3)_2$ 75-28-6 TZ4300000	2-Methylpropane [Note: Also see specific listing for n-butane.]	NIOSH 800 ppm (1960 mg/m ³) OSHA† none	N.D.	Colorless gas with a gasoline-like or natural gas odor. [Note: Shipped as a liquefied compressed gas. A liquid below 11°F.]	MW: 58.1 BP: 11°F Sol: 58 g/g FLP: NA (Gas) IP: 10.74 eV RGasD: 2.06 Flammable Gas Class IA Flammable Liquid	VP (70°F): 3.1 atm FRZ: -266°F UEL: 4.4% LEL: 1.8%	Strong oxidizers (e.g., nitrates & perchlorates), chlorine, fluorine, (richal carbonyl + oxygen)	None available
1011 22	1 ppm = 2.42 mg/m ³							
Isobutyl acetate $\text{CH}_3\text{COOCH}_2\text{CH}(\text{CH}_3)_2$ 110-19-0 AI4025000	Isobutyl ester of acetic acid, 2-Methylpropyl acetate, 2-Methylpropyl ester of acetic acid, 2-Methylpropyl ethanoate	NIOSH/OSHA 150 ppm (700 mg/m ³) OSHA† 100 ppm (360 mg/m ³)	1300 ppm [LEL]	Colorless liquid with a fruity, floral odor.	MW: 116.2 BP: 243°F Sol (77°F): 0.6% Fl P: 64°F IP: 9.97 eV	VP: 13 mm FRZ: -145°F UEL: 10.5% LEL: 1.3%	Nitrates, strong oxidizers, alkalis & acids	Char; CS; GC/FID; IR [§1450, Esters I]
1213 26	1 ppm = 4.83 mg/m ³				Sp. Gr: 0.87 Class IB Flammable Liquid			
Isobutyl alcohol $(\text{CH}_3)_2\text{CHCH}_2\text{OH}$ 78-83-1 NP9625000	IBA, Isobutanol, Isopropylcarbinol, 2-Methyl-1-propanol	NIOSH 50 ppm (150 mg/m ³) OSHA† 100 ppm (360 mg/m ³)	1600 ppm	Colorless, oily liquid with a sweet, musty odor	MW: 74.1 BP: 227°F Sol: 10% Fl P: 62°F IP: 10.12 eV	VP: 9 mm FRZ: -162°F UEL (202°F): 10.6% LEL (123°F): 1.7%	Strong oxidizers	Char; 2-Propanol/ CS; GC/FID; IR [§1401, Alcohols III]
1212 26	1 ppm = 3.08 mg/m ³				Sp. Gr: 0.80			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 6)	First aid (See Table 6)	Target organs (See Table 6)
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin, nose,	Eye:	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	500 ppm: SA:CF*/CCRFOV/GMFOV/	Ing	throat, head, dizz, cough,	Skin:	CNS
Wash skin:	When contam	PAPROV*/SCBAF/SAF	Con	dysp, nau, vomit, diarr;	Breath:	
Remove:	When wet (flam)	§ SCBAF PD PP/SAF PD PP ASCBA		skin cracking;	Swallow:	
Change:	N.R.	Escape: GMFOV/SCBAE		In animals: narco		
[Isomyl alcohol (secondary)]						
Skin:	Frostbite	TBAL	Inh	Drow, narco, asphy;	Eye:	CNS
Eyes:	Frostbite		Con	liq: frostbite	Skin:	
Wash skin:	N.R.		(aq)		Breath:	
Remove:	When wet (flam)					
Change:	N.R.					
Provide:	Frostbite					
[Isobutane]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin, upper	Eye:	Skin, eyes, resp sys,
Eyes:	Prevent eye contact	1300 ppm: SA:CF*/CCRFOV/GMFOV/	Ing	resp sys, head, drow, anes,	Skin:	CNS
Wash skin:	When contam	PAPROV*/SCBAF/SAF	Con	In animals: narco	Breath:	
Remove:	When wet (flam)	§ SCBAF PD PP/SAF PD PP ASCBA			Swallow:	
Change:	N.R.	Escape: GMFOV/SCBAE				
[Isobutyl acetate]						
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, throat, head,	Eye:	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	500 ppm: CCRFOV*/SA*	Ing	drow, skin cracking,	Skin:	CNS
Wash skin:	When contam	1250 ppm: SA:CF*/PAPROV*	Con	In animals: narco	Breath:	
Remove:	When wet (flam)	1800 ppm: CCRFOV/GMFOV/			Swallow:	
Change:	N.R.	PAPROV*/SCBAF/SAF				
		§ SCBAF PD PP/SAF PD PP ASCBA				
		Escape: GMFOV/SCBAE				
[Isobutyl alcohol]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P, IP, Sp. Gr, Flammability	VP, FRZ UEL, LEL		
Isobutyronitrile $(CH_3)_2CHCN$ 78-82-0 T24900000	Isopropyl cyanide, 2-Methylpropanenitrile, 2-Methylpropionitrile	NIOSH 8 ppm (22 mg/m ³) OSHA none	N.D.	Colorless liquid with an almond-like odor. [Note: Forms cyanide in the body.]	MW: 59.1 BP: 219°F Sol: Slight FLP: 47°F IP: ?	VP(130°F): 100 mm FRZ: -97°F UEL: ? LEL: ?	Oxidizers, reducing agents, strong acids & bases	Char; Benzene; GC/FID; II [Adapt #1606]
2284 28	1 ppm = 2.87 mg/m ³				Sp. Gr: 0.78 Class IB Flammable Liquid			
Isooctyl alcohol $C_8H_{18}CH_2OH$ 28952-21-8 NS7700000	Isooctanol, Oxoctyl alcohol [Note: A mixture of closely related isomeric, primary alcohols with branched chains such as 2-Ethyl- hexanol, $CH_3(CH_2)_3CH(CH_2CH_3)CH_2OH$]	NIOSH 50 ppm (270 mg/m ³) [skin] OSHA† none	N.D.	Clear, colorless liquid.	MW: 130.3 BP: 387°F Sol: Insoluble FLP(oc): 180°F IP: ?	VP: 0.4 mm FRZ: <-105°F UEL(test.): 5% LEL(calc.): 0.9%	None reported	None available
	1 ppm = 5.41 mg/m ³				Sp. Gr: 0.83 Class IIIA Combustible Liquid			
Isophorone $C_{10}H_{18}O$ 78-59-1 GW7700000	Isocetophorone, 3,5,5-Trimethyl-2-cyclo- hexenone, 3,5,5-Trimethyl-2-cyclo- hexen-1-one	NIOSH 4 ppm (23 mg/m ³) OSHA† 25 ppm (140 mg/m ³)	200 ppm	Colorless to white liquid with a peppermint-like odor.	MW: 138.2 BP: 419°F Sol 1% Fl.P 184°F IP: 9.07 eV	VP: 0.3 mm FRZ: 17°F UEL: 3.8% LEL: 0.8%	Oxidizers, strong alkalis, amines	Char(pet). CS, GC/FID, III [#2508]
1993 27 (combustible liquid, n.o.s.)	1 ppm = 5.74 mg/m ³				Sp. Gr: 0.92 Class IIIA Combustible Liquid			
Isophorone diisocyanate $C_{11}H_{18}N_2O_2$ 4098-74-8 NQ9370000	IPDI; 3-Isocyanatomethyl-3,5,5- trimethylcyclohexyl- isocyanate; Isophorone diamine diisocyanate	NIOSH 0.005 ppm (0.045 mg/m ³) ST 0.02 ppm (0.180 mg/m ³) [skin] OSHA† none	N.D.	Colorless to slightly yellow liquid with a pungent odor.	MW: 222.3 BP: ? Sol: Decomposes FLP: 311°F IP: ?	VP: 0.0003 mm FRZ: -78°F UEL: ? LEL: ?	Water, alcohols, phenols, amines, mercaptans, amides, urethanes, ureas [Note: Reacts with water to form carbon dioxide.]	None available
2290 55	1 ppm = 9.24 mg/m ³				Sp. Gr: 1.06 Class IIIB Combustible Liquid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 6)
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, skin, nose,	Eyes:	Eyes, skin, resp sys.
Eyes:	Prevent eye contact	80 ppm: CCROV/SA	Abs	throat; head, dizz, weak,	Skin:	CNS, CVS
Wash skin:	When contam	200 ppm: SA:CF/PAPROV	Inh	gidd, conf, convuls; dysp;	Breath:	
Remove:	When wet (flam)	400 ppm: CCRFOV/GMFOV/PAPRTOV/SCBAF/SAF	Ing	abdom pain, nau, vomit	Swallow:	
Change:	N.R.	1000 ppm: SAF:PD,PP	Con			
Provide:	Eyewash, Quick drench	§ SCBAF:PD,PP/SAF:PD,PP:ASCBA				
		Escape: GMFOV/SCBAE				
[acetylonitrile]						
Skin:	Prevent skin contact	TBAL	Inh	Irrit eyes, skin, nose,	Eyes:	Eyes, skin, resp sys
Eyes:	Prevent eye contact		Abs	throat; eye, skin burns	Skin:	
Wash skin:	When contam/Daily		Ing		Breath:	
Remove:	When wet or contam		Con		Swallow:	
Change:	N.R.					
Provide:	Eyewash					
[acetyl alcohol]						
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, nose, throat	Eyes:	Eyes, skin, resp sys
Eyes:	Prevent eye contact	40 ppm: CCROV/SA*	Abs	head, nau, dizz, fig, mal,	Skin:	CNS, liver, kidneys
Wash skin:	When contam	100 ppm: SA:CF/PAPROV*	Ing	narco, derm,	Breath:	
Remove:	When wet or contam	200 ppm: CCRFOV/GMFOV/PAPRTOV*/SAT CF*/SCBAF/SAF	Con	in animals: kidney, liver damage	Swallow:	
Change:	N.R.	§ SCBAF:PD,PP/SAF:PD,PP:ASCBA				
Provide:	Eyewash	Escape: GMFOV/SCBAE				
[isophorone]						
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, skin, resp sys;	Eyes:	Eyes, skin, resp sys
Eyes:	Prevent eye contact	0.05 ppm: SA*	Abs	chesttight, dysp, cough,	Skin:	
Wash skin:	When contam	0.125 ppm: SA:CF*	Ing	sore throat; bron, wheez,	Breath:	
Remove:	When wet or contam	0.25 ppm: SCBAF/SAF	Con	pulm edema; possible resp sens, asthma	Swallow:	
Change:	Daily	1 ppm: SAF:PD,PP				
Provide:	Quickdrench	§ SCBAF:PD,PP/SAF:PD,PP:ASCBA				
		Escape: GMFOV/SCBAE				
[isophorone diisocyanate]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide No.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL F.P., IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
2-Isopropoxyethanol (CH ₃) ₂ CHOCH ₂ CH ₂ OH 109-59-1 KL5075000	Ethylene glycol isopropyl ether, 8-hydroxyethyl isopropyl ether, isopropyl Cellosolve®, isopropyl glycol	NIOSH See Appendix D OSHA† none	N.D.	Colorless liquid with a mild, ethereal odor.	MW: 104.2 BP: 283°F Sol: Miscible FLP(oc): 92°F IP: 7	VP: 3 mm FRZ: ? UEL: ? LEL: 7	Oxidizers	None available
1 ppm = 4.33 mg/m ³					Sp.Gr. 0.90 Class IC Flammable Liquid			
Isopropyl acetate CH ₃ COOCH(CH ₃) ₂ 108-21-4 A14930000	Isopropyl ester of acetic acid, 1-Methylethyl ester of acetic acid, 2-Propyl acetate	NIOSH See Appendix D OSHA† 260 ppm (960 mg/m ³)	1800 ppm	Colorless liquid with a fruity odor.	MW 102.2 BP 194°F Sol 3% F.P. 36°F IP 9.95 eV	VP 42 mm FRZ -92°F UEL 8% LEL(100°F): 18%	Nitrates, strong oxidizers, alkalis & acids	Char, CS, GC/FID, II [#1454]
1220 26					Sp.Gr. 0.87 Class IB Flammable Liquid			
Isopropyl alcohol (CH ₃) ₂ CHOH 67-63-0 NT8050000	Dimethyl carbinol, IPA, Isopropanol, 2-Propanol, sec-Propyl alcohol, Rubbing alcohol	NIOSH 400 ppm (980 mg/m ³) ST 500 ppm (1225 mg/m ³) OSHA† 400 ppm (980 mg/m ³)	2000 ppm [LEL]	Colorless liquid with the odor of rubbing alcohol.	MW 60.1 BP 181°F Sol Miscible F.P. 53°F IP 10.10 eV	VP 33 mm FRZ -127°F UEL(200°F): 12.7% LEL 2.0%	Strong oxidizers, acetaldehyde, chlorine, ethylene oxide, acids, isocyanates	Char, 2-Butanol/ CS, GC/FID, II [#1400, Alcohols I]
1219 26					Sp.Gr. 0.79 Class IB Flammable Liquid			
Isopropylamine (CH ₃) ₂ CHNH ₂ 75-31-0 NT8400000	2-Aminopropane, Monoisopropylamine, 2-Propylamine, sec-Propylamine	NIOSH See Appendix D OSHA† 8 ppm (12 mg/m ³)	750 ppm	Colorless liquid with an ammonia- like odor [Note: A gas above 91°F.]	MW 59.1 BP 91°F Sol Miscible F.P(oc) -35°F IP 8.72 eV	VP 460 mm FRZ -150°F UEL ? LEL ?	Strong acids, strong oxidizers, aldehydes, ketones, epoxides	Bub NaOH GC/FID, II(3) [#S147]
1221 68					Sp.Gr. 0.69 Class IA Flammable Liquid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)	
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet (flamm) N.R.	TBAL	Inh Abs Ing Con	In animals: irrit eyes, skin; hemog, anemia, pulm edema	Eye: Skin: Breath: Swallow:	Irr. Immed Water/wash prompt Resp support Medical attention Immed	Eyes, skin, resp eye, blood
[2-Isopropoxyethanol]							
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet (flamm) N.R.	OSHA 1800 ppm: SA:CF/SCBAF/SAF § SCBAF PD PP/SAF PD PP ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, skin, nose, derm; In animals: narcosis	Eye: Skin: Breath: Swallow:	Irr. Immed Water flush prompt Resp support Medical attention Immed	Eyes, skin, resp eye, CNS
[Isopropyl acetate]							
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet (flamm) N.R.	NIOSH/OSHA 2000 ppm: SA:CF/CCRFOV/GMFOV/ PAPROV/SCBAF/SAF § SCBAF PD PP/SAF PD PP ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, nose, throat, drow, dizz, head, dry cracking skin; In animals: narcosis	Eye: Skin: Breath: Swallow:	Irr. Immed Water flush Resp support Medical attention Immed	Eyes, skin, resp eye, CNS
[Isopropyl alcohol]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet (flamm) N.R. Eyewash, Quick drench	OSHA 125 ppm: SA:CF/PAPRS* 250 ppm: CCRFS/GMFS/PAPRTS*/ SCBAF/SAF 750 ppm: SAF/PD,PP § SCBAF PD PP/SAF PD,PP ASCBA Escape: GMFS/SCBAE	Inh Abs Ing Con	Irrit eyes, skin, nose, throat, pulm edema, vas dist, eye, skin burns; derm	Eye: Skin: Breath: Swallow:	Irr. Immed Water flush Immed Resp support Medical attention Immed	Eyes, skin, resp sys

[Isopropylamine]

Chemical name, structure formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL, F.P., IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
N-isopropylaniline $C_9H_9NHCH(CH_3)_2$ 788-52-5 BY4190000	N-IPA, isopropylaniline, N-(1-methylethyl)- benzenamine, N-Phenylisopropylamine	NIOSH 2 ppm (10 mg/m ³) [skin] OSHA† none	N.D.	Clear, yellowish liquid with a sweet, aromatic odor.	MW: 135.2 BP: 337°F Sol: insoluble F.P.(oc): 190°F IP: ?	VP(77°F): 0.03 mm FRZ: -58°F UEL: ? LEL: ?	None reported	Filter* (2); Methanol; HPLC/UV; OSHA [#78]
	1 ppm = 5.62 mg/m ³				Sp Gr 60°F: 0.93 Class IIB Combustible Liquid			
Isopropyl ether $(CH_3)_2CHOCH(CH_3)_2$ 108-20-3 TZ5425000	Diisopropyl ether, Diisopropyl oxide, 2-isopropoxy propane	NIOSH/OSHA 500 ppm (2100 mg/m ³)	1400 ppm [LEL]	Colorless liquid with a sharp, sweet, ether-like odor.	MW: 102.2 BP: 154°F Sol: 0.2% F.P. -18°F IP: 9.20 eV	VP: 119 mm FRZ: -76°F UEL: 7.9% LEL: 1.4%	Strong oxidizers, acids [Note: Unstable peroxides may form on long contact of isopropyl ether with air.]	Char. CS, GC/FID, ■ [#S368]
1159 26	1 ppm = 4.25 mg/m ³				Sp Gr: 0.73 Class IIB Flammable Liquid			
Isopropyl glycidyl ether $C_6H_{10}O_2$ 4015-14-2 TZ3500000	1,2-Epoxy-3-isopropoxy- propane, IGE, isopropoxymethyl oxirane	NIOSH C: 50 ppm (240 mg/m ³) [15-min] OSHA† 50 ppm (240 mg/m ³)	400 ppm	Colorless liquid	MW: 116.2 BP: 279°F Sol: 15% F.P. 92°F IP: ?	VP(77°F): 9 mm FRZ: ? UEL: ? LEL: ?	Strong oxidizers, strong caustics [Note: May form explosive peroxides upon exposure to air or light.]	Char. CS, GC/FID, ■ [#S77]
	1 ppm = 4.83 mg/m ³				Sp Gr: 0.92 Class IC Flammable Liquid			
Kaolin 1332-58-7 GF1670500	China clay, Clay, Hydrated aluminum silicates, Hydrite, Porcelain clay [Note: Main constituent of Kaolin is Kaolinite [Al ₂ Si ₂ O ₅ (OH) ₄].]	NIOSH 10 mg/m ³ (total) 5 mg/m ³ (resp) OSHA† 15 mg/m ³ (total) 5 mg/m ³ (resp)	N.D.	White to yellowish or grayish powder. [Note: When moistened, darkens & develops a clay-like odor.]	MW: varies BP: ? Sol: insoluble F.P.: NA IP: NA	VP: 0 mm (approx) MLT: ? UEL: NA LEL: NA	None reported	Filter; none; Grav; ■ [Nuisance Dust: #0500 (total), #0600 (resp)]
					Sp Gr: 1.8-2.6 Noncombustible Solid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 5)	Target organs (See Table 5)
Skin:	Prevent skin contact	TBAL	Inh	Irrit eyes, skin; head,	Eye:	Eyes, skin, resp sys,
Eyes:	Prevent eye contact		Abs	weak, dizz; cyan; ataxia;	Skin:	blood, CVS, liver,
Wash skin:	When contam		Ing	dysp on effort; tacer;	Breath:	kidneys
Remove:	When wet or contam		Con	methemo	Swallow:	
Change:	N.R.					
Provide:	Quick drench					
[N-isopropylaniline]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin, nose,	Eye	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	1400 ppm: CCROV*/PAPROV*/GMFOV/	Ing	resp discomfort, derm,	Skin	CNS
Wash skin:	When contam	SA*/SCBAF	Con	in animals: drow, dizz,	Breath	
Remove:	When wet (flam)	§ SCBAF PD PP/SAF PD PP ASCBA		uncon, narco	Swallow:	
Change:	N.R.	Escape: GMFOV/SCBAE				
[Isopropyl ether]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin, upper	Eye	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	400 ppm: SA:CF/SCBAF	Ing	resp sys, skin sens,	Skin	blood, repro sys
Wash skin:	When contam	§ SCBAF PD PP/SAF PD PP ASCBA	Con	possible hemato,	Breath	
Remove:	When wet (flam)	Escape: GMFOV/SCBAE		repro effects	Swallow	
Change:	N.R.					
[Isopropyl glycidyl ether]						
Skin:	N.R.	TBAL	Inh	Chronic pulm fib,	Eye:	Resp sys, stomach
Eyes:	N.R.		Con	stomach granuloma	Breath:	
Wash skin:	N.R.					
Remove:	N.R.					
Change:	N.R.					
[Kaolin]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TLV unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Kepon $C_{10}Cl_{10}O$ 143-50-0 PC8575000	Chlordecone; Decachlorooctahydro-kepone- 2-one; Decachlorooctahydro-1,3,4- metheno-2H-cyclobuta(cd)- pentalen-2-one; Decachlorotetrahydro-4,7- methanoindeneone;	NIOSH Ca See Appendix A 0.001 mg/m ³ OSHA none	N.D.	Tan to white, crystalline, odorless solid. [insecticide]	MW: 490.6 BP: Sublimes Sol: 212°F: 0.5% FLP: NA IP: 7	VP(77°F): <3 x 10 ⁻⁶ mm MLT: 662°F (Sublimes) UEL: NA LEL: NA	Acids, acid fumes	Filter/ Imp; Benzene/ Methanol; GC/ECD; III [85508]
					Sp.Gr: 7 Noncombustible Solid			
Kerosene 8008-20-6 OA5500000 1223 27	Fuel Oil No. 1, Range oil [Note: A refined petroleum solvent (predominantly C ₁₀ -C ₂₅), which typically is 25% normal paraffins, 11% branched paraffins, 30% monocycloparaffins, 12% dicycloparaffins, 1% tricycloparaffins, 16% mononuclear aromatics & 5% dinuclear aromatics.] 1 ppm 7.07 mg/m ³ (approx)	NIOSH 100 mg/m ³ OSHA none	N.D.	Colorless to yellowish, oily liquid with a strong, character- istic odor.	MW: 170(approx) BP: 347-617°F Sol: Insoluble FLP: 100-162°F IP: 7	VP(100°F): 5 mm FRZ: -50°F UEL: 9% LEL: 0.7%	Strong oxidizers	Char; CS; GC/FID; III [81550, Naphthal]
					Sp.Gr: 0.81 Class II Combustible Liquid			
Ketene $CH_2=CO$ 463-51-4 OA7700000	Carbomethene, Ethenone, Keto-ethylene	NIOSH 0.5 ppm (0.9 mg/m ³) ST 1.5 ppm (3 mg/m ³) OSHA† 0.5 ppm (0.9 mg/m ³)	5 ppm	Colorless gas with a penetrating odor.	MW: 42.0 BP: -69°F Sol: Reacts FLP: NA (Gas) IP: 9.61 eV	VP: >1 atm FRZ: -238°F UEL: ? LEL: ?	Water, alcohols, ammonia [Note: Readily polymerizes. Reacts with water to form acetic acid.]	Bub. FeCl ₃ Vis. II(2) [8592]
					RGasD: 1.45 Flammable Gas			
Lead Pb 7439-92-1 OF7525000	Lead metal, Plumbum	NIOSH* 0.100 mg/m ³ See Appendix C OSHA* (1910.1025) 0.050 mg/m ³ See Appendix C [†Note: The REL and PEL also apply to other lead compounds (e.g., PbO ₂) - See Appendix C.]	100 mg/m ³ (as Pb)	A heavy, ductile, soft, gray solid.	MW: 207.2 BP: 3164°F Sol: Insoluble FLP: NA IP: NA	VP: 0 mm (approx) MLT: 521°F UEL: NA LEL: NA	Strong oxidizers, hydrogen peroxide, acids	Filter; HNO ₃ /H ₂ O ₂ ; AAS; III [87082] [Also #7105.]
					Sp.Gr: 11.34 Noncombustible Solid in bulk form.			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Routes	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 7)
Skin:	Prevent skin contact	NIOSH	Inh	Head, ear, tremor; liver, kidney damage; via diet;	Eye:	Eye, skin, resp sys,
Eyes:	Prevent eye contact	§ SCBAF/PD/PP/SAF/PD/PP/ASCBA	Abs	stomach, chest pain, skin	Skin:	CNS, liver, kidneys,
Wash skin:	When contam/Daily	Escape: GMFOVHIE/SCBAE	Ing	eryt; testicular atrophy,	Breath:	repro sys
Remove:	When wet or contam		Con	low sperm count; [canc]	Swallow:	[in animals: liver cancer]
Change:	Daily					
Provide:	Eyewash, Quick drench					
[Kapone]						
Skin:	Prevent skin contact	NIOSH	Inh	Irr eyes, skin, nose,	Eye:	Eye, skin, resp sys,
Eyes:	Prevent eye contact	1000 ppm: CCROV/SA	Ing	throat; burning sensation	Skin:	CNS
Wash skin:	When contam	2500 ppm: SA:CF/PAPROV	Con	in chest; head, nau, weak,	Breath:	
Remove:	When wet or contam	5000 ppm: CCRFOV/GMFOV/PAPRTOV/		restless, inco, conf, drow;	Swallow:	
Change:	N.R.	§ SCBAF/PD/PP/SAF/PD/PP/ASCBA		vomit, diarr, demt;		
Provide:	Quick drench	Escape: GMFOV/SCBAE		chemical press (aspirin)		
[Kerosene]						
Skin:	N.R.	NIOSH/OSHA	Inh	Irr eyes, skin, nose,	Breath	Eye, skin, resp sys
Eyes:	N.R.	5 ppm: SA/SCBAF	Con	throat, resp sys; pulm edema	Resp support	
Wash skin:	N.R.	§ SCBAF PD/PP/SAF PD/PP/ASCBA				
Remove:	N.R.	Escape: GMFOV/SCBAE				
Change:	N.R.					
[Ketene]						
Skin:	Prevent skin contact	OSHA	Inh	Weak, lass, insom, facial	Eye	Eye, GI tract, CNS,
Eyes:	Prevent eye contact	0.5 mg/m ³ HIE/SA	Ing	pallor, pal eye, anor,	Skin	kidneys, blood,
Wash skin:	Daily	1.25 mg/m ³ SA:CF/PAPRHE	Con	low-wgt, malnut, constp,	Breath:	gingival tissue
Remove:	When wet or contam	2.5 mg/m ³ HIEF/SAT CF/PAPRTHIE/		abdom pain, colic, anemia,	Swallow:	
Change:	Daily	SCBAF/SAF		gingival lead line,		
		50 mg/m ³ SA PD/PP		tremor, para wrist, arities,		
		100 mg/m ³ SAF PD/PP		encephalopathy, kidney		
		§ SCBAF PD/PP/SAF PD/PP/ASCBA		disease; err eyes,		
		Escape: HIEF/SCBAE		hypotension		
[Lead]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL F.P., IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Limestone CaCO_3 1317-65-3 EV9580000	Calcium carbonate, Natural calcium carbonates [Note: Calcite & aragonite are commercially important natural calcium carbonates.]	NIOSH 10 mg/m ³ (total) 5 mg/m ³ (resp) OSHA 15 mg/m ³ (total) 5 mg/m ³ (resp)	N.D.	Odorless, white to tan powder.	MW: 100.1 BP: Decomposes Sol: 0.001% F.P.: NA IP: NA Sp.Gr: 2.7-2.9 Noncombustible Solid	VP: 0 mm (approx) MLT: 1517- 2442°F (Decomposes) UEL: NA LEL: NA	Fluorine, magnesium, acids, alum, ammonium salts	Filter; none; Gnr; III [Nuisance Dust: #8500 (total), #0500 (resp)]
Lindane $\text{C}_6\text{H}_6\text{Cl}_6$ 58-89-9 GV4900000 2761 55	BHC, HCH γ-Hexachlorocyclohexane, gamma-isomer of 1,2,3,4,5,6- Hexachlorocyclohexane	NIOSH/OSHA 0.5 mg/m ³ [skin]	50 mg/m ³	White to yellow, crystalline powder with a slight, musty odor [pesticide]	MW: 290.8 BP: 614°F Sol: 0.001% F.P.: NA IP: ? Sp.Gr: 1.85 Noncombustible Solid, but may be dissolved in flammable liquids	VP: 0.00001 mm MLT: 235°F UEL: NA LEL: NA	Corrosive to metals	Filter/Bub. Isocutane, GC/EConD. III [#5502]
Lithium hydride LiH 7580-67-8 QJ6300000 1414 40 2805 40 (fused solid)	Lithium monohydride	NIOSH/OSHA 0.025 mg/m ³	0.5 mg/m ³	Odorless, off- white to gray, translucent, crystalline mass or white powder. Sp.Gr: 0.78 Combustible Solid that can form airborne dust clouds which may explode on contact with flame, heat, or oxidizers	MW: 7.95 BP: Decomposes Sol: Reacts F.P.: NA IP: NA	VP: 0 mm (approx) MLT: 1256°F UEL: NA LEL: NA	Strong oxidizers, halogenated hydro- carbons, acids, water [Note: May ignite SPONTANEOUSLY in air and may reignite after fire is extinguished. Reacts with water to form hydrogen & lithium hydroxide.]	None available
L.P.G. $\text{C}_2\text{H}_2/\text{C}_2\text{H}_4/\text{C}_3\text{H}_8/\text{C}_4\text{H}_{10}$ 68476-85-7 SE7545000 1075 22	Bottled gas, Compressed petroleum gas, Liquefied hydrocarbon gas, Liquefied petroleum gas, LPG [Note: A fuel mixture of propane, propylene, butanes & butylenes.] 1 ppm = 1.75-2.41 mg/m ³	NIOSH/OSHA 1000 ppm (1800 mg/m ³)	2000 ppm [LEL]	Colorless, noncor- rosive, odorless gas when pure. [Note: A foul- smelling odorant is usually added. Shipped as a liquefied compressed gas.]	MW: 42-58 BP: >44°F Sol: Insoluble F.P.: NA (Gas) IP: 10.95 eV RGasD: 1.45-2.00 Flammable Gas	VP: >1 atm FRZ: ? UEL: 9.5% (Propane) 8.5% (Butane) LEL: 2.1% (Propane) 1.9% (Butane)	Strong oxidizers, chlorine dioxide	Combustible gas meter, none, none, II(2) [#593]

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection – maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 6)	First aid (See Table 6)	Target organs (See Table 6)
Skin:	N.R.	TBAL	Inh	Irrit eyes, skin, muc memb;	Eye:	Eye, skin, resp sys
Eyes:	N.R.		Con	cough, sneez, rhin; lac	Skin:	
Wash skin:	N.R.				Breath:	
Remove:	N.R.					
Change:	N.R.					
[Limestone]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin, nose,	Eye:	Eye, skin, resp sys,
Eyes:	N.R.	5 mg/m ³ CCR/ODMFu/SA	Abs	throat, head, nau, dionic	Skin:	CNS, blood, liver,
Wash skin:	When contam	12.5 mg/m ³ SA/CF*/PAPROVDMFu*	Ing	convuls, resp difficulty,	Breath:	kidneys
Remove:	When wet or contam	25 mg/m ³ CCRFOVH/E/GMFOVH/E/	Con	cyan, aplastic anemia,	Swallow:	
Change:	Daily	PAPRTOVH/E*/SCBAF/SAF		muscle spasm,		
Provide:	Quick drench	60 mg/m ³ SAF/PD,PP		in animals: liver, kidney		
		5 SCBAF PD,PP/SAF PD,PP,ASCBA		damage		
		Escape: GMFOVH/E/SCBAE				
[Lindane]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin; eye,	Eye:	Eye, skin, resp sys,
Eyes:	Prevent eye contact	0.25 mg/m ³ H/E/SA	Ing	skin burns; mouth,	Skin:	CNS
Wash skin:	Brush (DO NOT WASH)	0.8 mg/m ³ SA/CF*/HIEF/PAPRHIE*/	Con	esophagus burns (if	Breath:	
Remove:	When wet or contam	SCBAF/SAF		ingested), nau, muscle	Swallow:	
Change:	Daily	5 SCBAF PD,PP/SAF PD,PP,ASCBA		twitches, mental conf,		
Provide:	Eyewash, Quick drench (>0.5 mg/m ³)	Escape: HIEF/SCBAE		blurred vision		
[Lithium hydride]						
Skin:	Frostbite	NIOSH/OSHA	Inh	L-head, drow, asphy;	Eye:	Resp sys, CNS
Eyes:	Frostbite	2000 ppm: SA/SCBAF	Con	liq; frostbite	Skin:	
Wash skin:	N.R.	5 SCBAF PD,PP/SAF PD,PP,ASCBA	(Hq)		Breath:	
Remove:	When wet (flamm)	Escape: SCBAE				
Change:	N.R.					
Provide:	Frostbite					

[L.P.G.]

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL F.P., IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Magnesite $MgCO_3$ 548-93-0 QM2470000	Carbonate magnesum, Hydromagnesite, Magnesium carbonate, Magnesium(II) carbonate [Note: Magnesite is a naturally-occurring form of magnesium carbonate.]	NIOSH 10 mg/m ³ (total) 5 mg/m ³ (resp) OSHA 15 mg/m ³ (total) 5 mg/m ³ (resp)	N.D.	White, odorless, crystalline powder.	MW: 84.3 BP: Decomposes Sol: 0.01% F.P.: NA IP: NA Sp.Gr: 2.88 Noncombustible Solid	VP: 0 mm (approx) MLT: 662°F (Decomposes) UEL: NA LEL: NA	Acids, formaldehyde	Filter; none; Grav; ■ [Nuisance Dust; #0500 (total), #0600 (resp)]
Magnesium oxide fume MgO 1309-48-4 OM3850000	Magnesia fume	NIOSH See Appendix D OSHA† 15 mg/m ³	750 mg/m ³	Finely divided white particulate dispersed in air [Note: Exposure may occur when magnesium is burned, thermally out, or welded upon.]	MW 40.3 BP 5512°F Sol(86°F): 0.009% F.P. NA IP: NA Sp Gr 3.58 Noncombustible Solid	VP 0 mm (approx) MLT 5072°F UEL NA LEL NA	Chlorine trifluoride, phosphorus penta- chloride	Filter, Acid, ICP, ■ [#7300, Elements]
Malathion $C_{10}H_{19}O_6PS_2$ 121-75-5 WM8400000 2783 55	S-(1,2-bis(ethoxycarbonyl)- ethyl)O,O-dimethyl- phosphorodithioate, Diethyl (dimethoxyphosphino- thioylthio) succinate [(CH ₃ O) ₂ P(S)SCH(COOC ₂ H ₅) ₂]- CH ₂ COOC ₂ H ₅]	NIOSH 10 mg/m ³ [skin] OSHA† 15 mg/m ³ [skin]	250 mg/m ³	Deep-brown to yellow liquid with a garlic-like odor (insecticide) [Note: A solid below 37°F]	MW 330.4 BP 140°F (Decomposes) Sol 0.02% F.P.(oc) >325°F IP: ? Sp Gr 1.21 Class IIIB Combustible Liquid, but may be difficult to ignite.	VP 0.00004 mm FRZ 37°F UEL ? LEL ?	Strong oxidizers, magnesium, alkaline pesticides [Note: Corrosive to metals]	Filter, Isocutane, GC/FPD, ■ [#5012]
Maleic anhydride $CH=CHC(O)OCO$ 108-31-6 ON3675000 2215 60	cis-Butenedioic anhydride, 2,5-Furandione, Maleic acid anhydride, Toxic anhydride	NIOSH/OSHA 1 mg/m ³ (0.25 ppm)	10 mg/m ³	Colorless needles, white lumps, or pellets with an irritating, choking odor	MW 98.1 BP 396°F Sol Reacts F.P 218°F IP: 9.90 eV Sp Gr 1.48 Combustible Solid, but may be difficult to ignite	VP 0.2 mm MLT 127°F UEL 7.1% LEL 1.4%	Strong oxidizers, water, alkalis, metals, caustics & amines above 150°F [Note: Reacts slowly with water (hydro- lyzes) to form maleic acid]	Bub. none, HPLC/UV, ■ [#3512]

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 6)	First aid (See Table 8)	Target organs (See Table 5)
Skin:	N.R.	TBAL	Inh Con	Irrit eyes, skin, resp sys; cough	Eye: Breath: Irr. Irrimed Fresh air	Eyes, skin, resp sys
Eyes:	N.R.					
Wash skin:	N.R.					
Remove:	N.R.					
Change:	N.R.					
[Magnesia]						
Skin:	N.R.	OSHA	Inh	Irrit eyes, nose;	Breath	Eyes, resp sys
Eyes:	N.R.	150 mg/m ³ : DMF _u /SA	Con	metal fume fever; cough,	Resp support	
Wash skin:	N.R.	375 mg/m ³ : SA:CF/PAPRDMF _u		chest pain, flu-like fever		
Remove:	N.R.	750 mg/m ³ : HIEF/PAPRTHIE/ SCBAF/SAF				
Change:	N.R.	§ SCBAF PD PP/SAF PD PP ASCBA Escape HIEF/SCBAE				
[Magnesium oxide fume]						
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, skin, mucos,	Eye	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	100 mg/m ³ : CCROVDMF _u /SA	Abs	aching eyes, blurred vision,	Skin	fever, blood chol,
Wash skin:	When contam	250 mg/m ³ : SA:CF/CCRFOVHIE/ GMFOVHIE/PAPROVDMF _u / SCBAF/SAF	Ing Con	lac. saliv. anor nau vomit, abdom cramps, diarr, gidd, conf, ataxia, rin, head, chest tight, wheez, lar spasm	Breath: Swallow:	CNS, CVS, GI tract
Remove:	When wet or contam	§ SCBAF PD PP/SAF PD PP ASCBA Escape GMFOVHIE/SCBAE			Medical attention immed	
Change:	Daily					
[Methion]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit nose, upper resp sys,	Eye	Eyes, skin, resp sys
Eyes:	Prevent eye contact	10 mg/m ³ : SA:CF/SCBAF/SAF	Ing	conj. photo double vision,	Skin	
Wash skin:	When contam	§ SCBAF PD PP/SAF PD PP ASCBA Escape GMFOVHIE/SCBAE	Con	bronchial asthma, derm	Breath: Swallow:	
Remove:	When wet or contam				Medical attention immed	
Change:	N.R.					
Provide:	Eyewash					
[Maleic anhydride]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P, IP, Sp. Gr, Flammability	VP, FRZ UEL, LEL		
Malonaldehyde <chem>CHOCH2CHO</chem> 542-73-8 TX6475000	Malonic aldehyde; Malonodialdehyde; Propenedial; 1,3-Propanedial [Note: Pure Malonaldehyde is unstable and may be used as its sodium salt.]	NIOSH Ca See Appendix A See Appendix C (Aldehydes) OSHA none	Ca [N.D.]	Solid (needles).	MW: 72.1 BP: ? Sol: ? Fl.P: ? IP: ? Sp. Gr: ?	VP: ? MLT: 181°F UEL: ? LEL: ?	Proteins [Note: Pure compound is stable under neutral conditions, but not under acidic conditions.]	None available
Malononitrile <chem>NCCH2CN</chem> 109-77-3 OO3150000	Cyanoacetoneitrile, Dicyanomethane, Malonic dinitrile	NIOSH 3 ppm [8 mg/m³] OSHA none	N.D.	White powder or colorless crystals. [Note: Melts above 90°F. Forms cyanide in the body.]	MW: 66.1 BP: 426°F Sol: 13% Fl.P (Dec): 266°F IP: 12.88 eV Sp. Gr: 1.19 Combustible Solid	VP: ? MLT: 90°F UEL: ? LEL: ?	Strong bases [Note: May polymerize violently on prolonged heating at 265°F, or in contact with strong bases at lower temperatures.]	Char; Toluene; GC/FID; NIOSH Nitriles Crit. Doc.
2647 53	1 ppm = 2.75 mg/m³							
Manganese compounds and fume (as Mn) Mn (Metal) 7439-96-5 (Metal) OO9275000 (Metal)	Manganese metal Colloidal manganese, Manganese-55 Synonyms of other compounds vary depending upon the specific manganese compound	NIOSH* 1 mg/m³ ST 3 mg/m³ OSHA† C 6 mg/m³ [Note: Also see specific listings for Manganese cyclopentadienyl tricarbonyl, Methyl cyclopentadienyl manganese tricarbonyl, and Manganese tetroxide.]	500 mg/m³ (as Mn)	Metal: A lustrous, brittle, silvery solid	MW: 54.9 BP: 3564°F Sol: Insoluble Fl.P: NA IP: NA Sp. Gr: 7.20 (Metal) Metal: Combustible Solid	VP: 0 mm (approx) MLT: 2271°F UEL: NA LEL: NA	Oxidizers [Note: Will react with water or steam to produce hydrogen.]	Filter, Acid, ICP, III [#7300, Elements]
Manganese cyclopenta- dienyl tricarbonyl (as Mn) <chem>C5H5Mn(CO)3</chem> 12079-65-1 OO9720000	Cyclopentadienylmanganese tricarbonyl, Cyclopentadienyl tricarbonyl manganese, MCT	NIOSH 0.1 mg/m³ [skin] OSHA† C 6 mg/m³	N.D.	Yellow, crystalline solid with a characteristic odor. [Note: An antiknock additive for gasoline. May be found in an oil & gaseous solution.]	MW: 204.1 BP: Sublimes Sol: Slight Fl.P: ? IP: ? Sp. Gr: ? Combustible Solid	VP: ? MLT: 167°F (Sublimes) UEL: ? LEL: ?	None reported	None available

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 6)	First aid (See Table 6)	Target organs (See Table 6)	
Skin:	Prevent skin contact	NIOSH §: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, skin, resp sys; cough; CNS depres; [canc]	Eye:	In Irrmed	Eyes, skin, resp sys, CNS [in animals: thyroid gland tumors]
Eyes:	Prevent eye contact				Skin:	Water flush Irrmed	
Wash skin:	When contam/Daily				Breath:	Resp support	
Remove:	When wet or contam				Swallow:	Medical attention	
Change:	Daily					Irrmed	
Provide:	Eyewash, Quick drench						
[Malonaldehyde]							
Skin:	Prevent skin contact	NIOSH 80 mg/m ³ : SA 200 mg/m ³ : SA:CF 400 mg/m ³ : SCBAF/SAF 667 mg/m ³ : SAF:PD,PP §: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, skin, nose, throat; head, dizz, weak, gidd, conf, convuls; dysp; abdom pain, nau, vomit	Eye:	In Irrmed	Eyes, skin, resp sys, CNS, CVS
Eyes:	Prevent eye contact				Skin:	Water wash Irrmed	
Wash skin:	When contam				Breath:	Resp support	
Remove:	When wet or contam				Swallow:	Medical attention	
Change:	Daily					Irrmed	
Provide:	Eyewash, Quick drench						
[Malononitrile]							
Skin:	N.R.	NIOSH 10 mg/m ³ : DMXSO ₂ /SA 25 mg/m ³ : SA:CF/PAPRDM* 50 mg/m ³ : HIEF/SAT CF/PAPRTHIE/ SCBAF/SAF/ 500 mg/m ³ : SA:PD,PP §: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HIEF/SCBAE	Inh Ing	Parkinson's; asthena, insom, mental conf, metal fume fever; dry throat; cough, chest tight, dysp, rales; flu-like fever, low-back pain; vomit, mal fig, kidney damage	Breath:	Resp support	Resp sys, CNS, blood, kidneys
Eyes:	N.R.				Swallow:	Medical attention	
Wash skin:	N.R.					Irrmed	
Remove:	N.R.						
Change:	N.R.						
[Manganese compounds and fume (as Mn)]							
Skin:	Prevent skin contact	TBAL	Inh Abs Ing Con	In animals: Irrit skin; pulm edema; convuls; CNS; resp sys, kidney changes; decr resistance to infection	Eye:	In Irrmed	Skin, resp sys, CNS, kidneys
Eyes:	Prevent eye contact				Skin:	Soap wash	
Wash skin:	When contam				Breath:	Resp support	
Remove:	When wet or contam				Swallow:	Medical attention	
Change:	Daily					Irrmed	
[Manganese compounds and fume (as Mn)]							

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TLV unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, Flammability	VP, FRZ UEL, LEL		
Manganese tetroxide (as Mn) Mn₂O₄ 1317-35-7 OP0895000	Manganese oxide, Manganomanganic oxide, Trimanganese tetroxide, Trimanganese tetroxide	NIOSH See Appendix D OSHA† C 5 mg/m ³	N.D.	Brownish-black powder. [Note: Fumes are generated when evermanganese oxides are heated strongly in air.]	MW: 228.8 BP: 7 Sol: Insoluble FLP: NA IP: NA Sp.Gr: 4.88	VP: 0 mm (approx) MLT: 2347°F UEL: NA LEL: NA	Soluble in hydrochloric acid (liberates chlorine gas)	Filter; Acid; ICP; II [#7300, Elements]
Marble CaCO₃ 1317-65-3 EV9580000	Calcium carbonate, Natural calcium carbonate [Note: Marble is a metamorphic form of calcium carbonate.]	NIOSH 10 mg/m ³ (total) 5 mg/m ³ (resp) OSHA 15 mg/m ³ (total) 5 mg/m ³ (resp)	N.D.	Odorless, white powder.	MW: 100.1 BP: Decomposes Sol: 0.001% FLP: NA IP: NA Sp.Gr: 2.7-2.9 Noncombustible Solid	VP: 0 mm (approx) MLT: 1517-2442°F (Decomposes) UEL: NA LEL: NA	Fluorine, magnesium, acids, alum, ammonium salts	Filter; none; Grav; II [Nuisance Dust: #500 (total), #600 (resp)]
Mercury compounds [except (organo) alkyls] (as Hg) Hg (Metal) 7439-97-6 (Metal) OV4550000 (Metal) 2809 60	Mercury metal, Colloidal mercury, Elemental mercury, Metallic mercury, Quicksilver Synonyms of "other" Hg compounds vary depending upon the specific compound 1 ppm = 8.34 mg/m ³ (Metal)	NIOSH Hg Vapor: 0.05 mg/m ³ (skin) Other: C 0.1 mg/m ³ (skin) OSHA† C 0.1 mg/m ³	10 mg/m³ (as Hg)	Metal: Silver-white, heavy, odorless liquid [Note: "Other" Hg compounds include all inorganic & aryl Hg compounds except (organo) alkyls.]	MW: 200.6 BP: 674°F Sol: Insoluble FLP: NA IP: ? Sp.Gr: 13.6 (Metal) Metal: Noncombustible Liquid	VP: 0.0012 mm FRZ: -38°F UEL: NA LEL: NA	Acetylene, ammonia, chlorine dioxide, azides, calcium (amalgam formation), sodium carbide, lithium, rubidium, copper	Hydr; Acid; AA: cold; II [#6009, Mercury]
Mercury (organo) alkyl compounds (as Hg)	Synonyms vary depending upon the specific (organo) alkyl mercury compound.	NIOSH 0.01 mg/m ³ ST 0.03 mg/m ³ (skin) OSHA† 0.01 mg/m ³ C 0.04 mg/m ³	2 mg/m³ (as Hg)	Appearance and odor vary depending upon the specific (organo) alkyl mercury compound.	Properties vary depending upon the specific (organo) alkyl mercury compound.		Strong oxidizers such as chlorine	None available

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	N.R.	TBAL	Inh	Aspiration, insom, mental	Eye:	Resp sys, CNS,
Eyes:	N.R.		ing	conf; low-back pain, vomit;	Skin:	blood, kidneys
Wash skin:	N.R.		Con	mal, fig; kidney damage;	Breath:	
Remove:	N.R.			pneumia	Swallow:	
Change:	Daily					

[Manganese tetroxide (as Mn)]

Skin:	N.R.	TBAL	Inh	Irrit eyes, skin, muc memb,	Eye:	Eyes, skin, resp sys
Eyes:	N.R.		Con	upper resp sys; cough,	Skin:	
Wash skin:	N.R.			anorex, rhin; lac	Breath:	
Remove:	N.R.					
Change:	N.R.					

[Merbio]

Skin:	Prevent skin contact	See Appendix E for	Inh	Irrit eyes, skin, cough,	Eye	Eyes, skin, resp sys,
Eyes:	N.R.	Respirator Recommendations	Abs	chest pain, dysp, bron	Skin	CNS, kidneys
Wash skin:	When contam	for Mercury compounds	ing	pneumia, tremor, insom,	Breath	
Remove:	When wet or contam	[except (organo) alkyls].	Con	emty, indecision, head,	Swallow:	
Change:	Daily			fig, weak, stomatitis, saliv,		
				GI dist, anor, low-wgt, prot		

[Mercury compounds [except (organo) alkyls] (as Hg)]

Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Pares, ataxia, dysarthria,	Eye	Eyes, skin, CNS,
Eyes:	Prevent eye contact	0.1 mg/m ³ SA	Abs	vision, hearing dist,	Skin	PNS, kidneys
Wash skin:	When contam	0.25 mg/m ³ SA CF	ing	apexicity, jerking limbs;	Breath	
Remove:	When wet or contam	0.5 mg/m ³ SAT CF/SCBAF/SAF	Con	dizz, saliv, lac, nau, vomit,	Swallow:	
Change:	Daily	2 mg/m ³ SA:PD,PP		diarr constip, skin burns,		
Provide:	Eyewash, Quick drench	5 SCBAF PD,PP/SAF PD,PP ASCBA		emotional dist, kidney lnj;		
		Escape SCBAE		possible terato effects		

[Mercury (organo) alkyl compounds (as Hg)]

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Mesityl oxide (CH ₃) ₂ C=CHCOCH ₃ 141-79-7 SB4200000	Isobutenyl methyl ketone, Isopropylidene acetone, Methyl isobutenyl ketone, 4-Methyl-3-penten-2-one	NIOSH 10 ppm (40 mg/m ³) OSHA† 25 ppm (100 mg/m ³)	1400 ppm [LEL]	Oily, colorless to light-yellow liquid with a peppermint- or honey-like odor.	MW: 98.2 BP: 265°F Sol: 3% FLP: 87°F IP: 9.08 eV	VP: 9 mm FRZ: -52°F UEL: 7.2% LEL: 1.4%	Oxidizers, acids	Char; Methanol/CS, GC/FO, IR [1301, Ketones II]
1229 26	1 ppm = 4.08 mg/m ³				Sp Gr(59°F): 0.86 Class IC Flammable Liquid			
Methacrylic acid CH ₂ =C(CH ₃)COOH 79-41-4 OZ2975000	Methacrylic acid (glacial), Methacrylic acid (inhibited), α-Methacrylic acid, 2-Methylacrylic acid, 2-Methylpropenoic acid	NIOSH 20 ppm (70 mg/m ³) [skin] OSHA† none	N.D.	Colorless liquid or solid (below 61°F) with an acrid, repulsive odor.	MW: 86.1 BP: 323°F Sol(77°F): 9% FLP(oc): 171°F IP: 7	VP: 6.7 mm FRZ: 61°F UEL: 7 LEL: 7	Oxidizers, elevated temperatures, hydrochloric acid [Note: Typically contains 100 ppm of the monomethyl ether of hydroquinone to prevent polymerization.]	None available
2531 60 (inhibited)	1 ppm = 3.58 mg/m ³				Sp.Gr: 1.02 (Liquid) Class IIIA Combustible Liquid			
Methomyl CH ₃ C(SCH ₃)NOC(O)NHCH ₃ 16752-77-5 AK2975000	Lannate®, Methyl N-(methylamino)-carbamoyloxyethanimidothioate, S-Methyl-N-(methylcarbamoyloxy)thioacetimidate	NIOSH 2.5 mg/m ³ OSHA† none	N.D.	White, crystalline solid with a slight, sulfur-like odor. [Insecticide]	MW: 162.2 BP: 7 Sol(77°F): 6% FLP: NA IP: 7	VP(77°F): 0.00005 mm MLT: 172°F UEL: NA LEL: NA	Strong bases	None available
2757 55 (carbamate pesticide, solid, n.o.s.)					Sp.Gr(75°F): 1.29 Noncombustible Solid, but may be dissolved in flammable liquids.			
Methoxychlor (C ₆ H ₅ OCH ₂) ₂ CHCCl ₃ 72-43-5 KJ3675000	p,p'-Dimethoxydiphenyltrichloroethane, DMDT, Methoxy-DDT, 2,2-bis(p-Methoxyphenyl)-1,1,1-trichloroethane, 1,1,1-Trichloro-2,2-bis-(p-methoxyphenyl)ethane	NIOSH Ca See Appendix A OSHA† 15 mg/m ³	Ca [5000 mg/m ³]	Colorless to light-yellow crystals with a slight, fruity odor [insecticide]	MW: 345.7 BP: Decomposes Sol: 0.00001% FLP: ? IP: ?	VP: Very low MLT: 171°F UEL: ? LEL: ?	Oxidizers	Filter; Isocane; GC/EC, IR(4) [8371]
2781 55 (organochlorine pesticide, solid, n.o.s.)					Sp Gr: 1.41 Combustible Solid, but difficult to burn.			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)		Health hazards				
				Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 6)	
Skirt:	Prevent skin contact	NIOSH		Inh	Irrit eyes, skin, muc	Eye	Irritated	Eyes, skin, resp
Eyes:	Prevent eye contact	250 ppm: SA CF ⁴ /PAPROV ⁴		Ing	membr, narco, coma,	Skin	Water flush, rinsed	eyes, CNS, liver,
Wash skin:	When contam	500 ppm: CCRFOV/GMFOV/PAPRTOV ⁴		Con	in animals: liver, kidney	Breath:	Resp support	kidneys
Remove:	When wet (flam)	SCBAF/SAF			damage; CNS effects	Swallow:	Medical attention	
Change:	N.R.	1400 ppm: SAF-PD, PP					immed	
Provide:	Quick drench	§ SCBAF PD PP/SAF PD PP, ASCBA						
		Escape: GMFOV/SCBAE						

[Mesityl oxide]

Skirt:	Prevent skin contact	TBAL	Inh	Irrit eyes, skin, muc memb;	Eye:	Irr. Immed	Eyes, skin, resp eyes
Eyes:	Prevent eye contact		Abs	eye, skin burns	Skirt:	Water flush, rinsed	
Wash skin:	When contam		Ing		Breath:	Resp support	
Remove:	When wet or contam		Con		Swallow:	Medical attention	
Change:	Daily					immed	
Provide:	Eyewash, Quick drench						

[Methacrylic acid]

Skirt:	Prevent skin contact	TBAL	Inh	Irrit eyes; blurred vision,	Eye:	Irr. Immed	Eyes, resp eyes, CNS,
Eyes:	Prevent eye contact		Ing	miosis; saliv, abdom cramps,	Skirt:	Water flush, rinsed	CNS, liver, kidneys,
Wash skin:	When contam		Con	nausea, vomit; dysp; weak,	Breath:	Resp support	blood clot
Remove:	When wet or contam			musc twitch; liver, kidney	Swallow:	Medical attention	
Change:	Daily			damage		immed	
Provide:	Quick drench						

[Methomyl]

Skirt:	Prevent skin contact	NIOSH	Inh	In animals: fasc, trembling,	Skin	Soap wash	CNS, liver, kidneys
Eyes:	N.R.	§ SCBAF PD, PP/SAF PD, PP, ASCBA	Ing	convuls, kidney, liver	Breath:	Fresh air	[In animals:
Wash skin:	When contam/Daily	Escape: GMFOV/H/SCBAE		damage, [carc]	Swallow:	Medical attention	liver & ovarian
Remove:	When wet or contam					immed	cancer]
Change:	Daily						

[Methoxychlor]

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TLV unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, Flammability	VP, FRZ UEL, LEL		
Methoxyflurane <chem>CHCl2CF2OCH3</chem> 78-38-8 KN7820000	2,2-Dichloro-1,1-difluoro- ethyl methyl ether; 2,2-Dichloro-1,1-difluoro- 1-methoxyethane; Methoxyflurane; Methoxyfluorane; Penthrane	NIOSH† C 2 ppm (13.3 mg/m³) (60-min) [*Note: REL for exposure to waste anesthetic gas.] OSHA none	N.D.	Colorless liquid with a fruity odor. [Inhalation anesthetic]	MW: 165.0 BP: 220°F Sol: Slight FLP: ? IP: ?	VP: 23 mm FRZ: -31°F UEL: ? LEL (178°F): 7%	None reported	None available
4-Methoxyphenol <chem>CH3OC6H4OH</chem> 158-78-5 SL7790000	Hydroquinone monomethyl ether; p-Hydroxyanisole; Mequinol; p-Methoxyphenol; Monomethyl ether hydroquinone	NIOSH 6 mg/m³ OSHA† none	N.D.	Colorless to white, waxy solid with an odor of caramel & phenol.	MW: 124.2 BP: 469°F Sol (77°F): 4% FLP (oc): 270°F IP: 7.50 eV	VP: <0.01 mm MLT: 135°F UEL: ? LEL: ?	Strong oxidizers, strong bases, acid anhydrides	None available
					Sp Gr: 1.55 Combustible Solid; under certain conditions, a dust cloud can probably explode if ignited by a spark or flame.			
Methyl acetate <chem>CH3COOCH3</chem> 79-20-9 A19100000	Methyl ester of acetic acid; Methyl ethanoate	NIOSH 200 ppm (610 mg/m³) ST 250 ppm (760 mg/m³) OSHA† 200 ppm (610 mg/m³)	3100 ppm [LEL]	Colorless liquid with a fragrant, fruity odor	MW 74.1 BP 135°F Sol: 25% FLP 14°F IP 10 27 eV	VP 173 mm FRZ -145°F UEL 16% LEL 3.1%	Nitrates, strong oxidizers, alkalis & acids, water [Note: Reacts slowly with water to form acetic acid & methanol]	Char. CS, GC/FID, ■ [#S42]
1231 26	1 ppm = 3.08 mg/m³				Sp Gr: 0.93 Class IB Flammable Liquid			
Methyl acetylene <chem>CH3C#CH</chem> 74-99-7 UK4250000	Alkyne; Propyne; Propyne; 1-Propyne	NIOSH/OSHA 1000 ppm (1650 mg/m³)	1700 ppm [LEL]	Colorless gas with a sweet odor [Note: A fuel that is shipped as a liquefied compressed gas]	MW 40.1 BP -10°F Sol: Insoluble FLP NA (Gas) IP 10 36 eV	VP 5.2 atm FRZ -153°F UEL ? LEL 1.7%	Strong oxidizers (such as chlorine), copper alloys [Note: Can decompose explosively at 4.5 to 5.6 atmospheres of pressure]	Bag, none, GC/FID, [H5] [#S64]

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)		Target organs (See Table 5)
Skin:	N.R.	TBAL	Inh ing Con	Irrit eyes; CNS depres, analgesia; anes, sez, resp depres; liver, kidney inj; in animals: repro, terato effects	Eye: Skin: Breath: Swallow:	In/irrad Soap wash Resp support Medical attention immed	Eyes, CNS, liver, kidneys, repro sys
[Methoxyflurane]							
Skin:	Prevent skin contact	TBAL	Inh Alta ing Con	Irrit eyes, skin, nose, throat, upper resp sys; eye, skin burns; CNS depres	Eye: Skin: Breath: Swallow:	In/irrad Soap flush immed Resp support Medical attention immed	Eyes, skin, resp sys, CNS
Eyes:	Prevent eye contact						
Wash skin:	When contam						
Remove:	When wet or contam						
Change:	Daily						
Provide:	Eyewash, Quick drench						
[4-Methoxyphenol]							
Skin:	Prevent skin contact	NIOSH/OSHA	Inh ing Con	Irrit eyes, skin, nose, throat, head, drow, optic nerve atrophy, chest tight; in animals: narco	Eye: Skin: Breath: Swallow:	In/irrad Water flush prompt Resp support Medical attention immed	Eyes, skin, resp sys, CNS
Eyes:	Prevent eye contact	2000 ppm: CCROV*/SA*					
Wash skin:	When contam	3100 ppm: SA:CF*/CCRFOV/GMFOV/ PAPROV*/SCBAF/SAF					
Remove:	When wet (flam)	§ SCBAF PD PP/SAF PD PP ASCBA					
Change:	N.R.	Escape GMFOV/SCBAE					
[Methyl acetate]							
Skin:	Frostbite	NIOSH/OSHA	Inh Con (liq)	Irrit resp sys; tremor, hyperexcitability, anes, liq: frostbite	Eye: Skin: Breath:	Frostbite Frostbite Resp support	Resp sys, CNS
Eyes:	Frostbite	1700 ppm: SA/SCBAF					
Wash skin:	N.R.	§ SCBAF PD PP/SAF PD PP ASCBA					
Remove:	When wet (flam)	Escape GMFOV/SCBAE					
Change:	N.R.						
Provide:	Frostbite						

[Methyl acetate]

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide No.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL, FLP, IP, Sp. Gr., flammability	VP, FRZ, UEL, LEL		
Methyl acetylene-propadiene mixture $\text{CH}_3\text{C}\equiv\text{CHCH}_2=\text{C}=\text{CH}_2$ 56355-75-8 UK4920000	MAPP gas, Methyl acetylene-alkene mixture, Methyl acetylene-propadiene mixture (stabilized), Propadiene-methyl acetylene, Propyne-alkene mixture, Propyne-propadiene mixture	NIOSH 1000 ppm (1800 mg/m ³) ST 1250 ppm (2250 mg/m ³) OSHA† 1000 ppm (1800 mg/m ³)	3400 ppm [LEL]	Colorless gas with a strong, characteristic, foul odor [Note: A fuel that is shipped as a liquefied compressed gas.]	MW: 40.1 BP: -36 to -4°F Sol: Insoluble FLP: NA [Gas] IP: ? RGasD: 1.48 Flammable Gas	VP: >1 atm FRZ: -213°F UEL: 10.8% LEL: 3.4%	Strong oxidizers, copper alloys [Note: Forms explosive compounds at high pressure in contact with alloys containing more than 67% copper.]	Bag, none, GC/FID, II(5) [§585]
1060 17 (stabilized)	1 ppm = 1.67 mg/m ³							
Methyl acrylate $\text{CH}_2=\text{CHCOOCH}_3$ 96-33-3 AT2800000	Methoxycarbonylethylene, Methyl ester of acrylic acid, Methyl propenoate	NIOSH/OSHA 10 ppm (30 mg/m ³) [skin]	250 ppm	Colorless liquid with an acid odor.	MW: 86.1 BP: 176°F Sol: 6% FLP: 27°F IP: 9.90 eV Sp. Gr.: 0.96 Class IB Flammable Liquid	VP: 65 mm FRZ: -106°F UEL: 25% LEL: 2.8%	Nitrates, oxidizers such as peroxides, strong alkalis [Note: Polymerizes easily, usually contains an inhibitor such as hydroquinone.]	Char, CS, GC/FID, III [§538]
1919 26 (inhibited)	1 ppm = 3.58 mg/m ³							
Methylacrylonitrile $\text{CH}_2=\text{C}(\text{CH}_3)\text{CN}$ 126-98-7 UD1400000	2-Cyanopropene-1, Isoprene cyanide, Methacrylonitrile, α -Methylacrylonitrile, 2-Methylpropenenitrile	NIOSH 1 ppm (3 mg/m ³) [skin] OSHA† none	N.D.	Colorless liquid with an odor like bitter almonds.	MW: 67.1 BP: 195°F Sol: 3% FLP: 34°F IP: ? Sp. Gr.: 0.80 Class IB Flammable Liquid	VP(77°F): 71 mm FRZ: -32°F UEL: 6.8% LEL: 2%	None reported	None available
3079 28 (inhibited)	1 ppm = 2.79 mg/m ³							
Methylal $\text{CH}_3\text{OCH}_2\text{OCH}_3$ 109-87-5 PA8750000	Dimethoxymethane, Formal, Formaldehyde dimethylacetal, Methoxymethyl methyl ether, Methylene dimethyl ether	NIOSH/OSHA 1000 ppm (3100 mg/m ³)	2200 ppm [LEL]	Colorless liquid with a chloroform-like odor.	MW: 76.1 BP: 111°F Sol: 33% FLP(oc): -26°F IP: 10.00 eV Sp. Gr.: 0.86 Class IB Flammable Liquid	VP: 330 mm FRZ: -157°F UEL: 13.8% LEL: 2.2%	Strong oxidizers, acids	Char, Hexane, GC/FID, III [§1611]

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	Frostbite	NIOSH/OSHA	Inh	Irrit resp sys; excitement,	Eyes:	Resp sys, CNS
Eyes:	Frostbite	3400 ppm: SA/SCBAF	Con	conf, atax; liq; frostbite	Skin:	Frostbite
Wash skin:	N.R.	§ SCBAF PD PP/SAF PD, PP ASCBA	(liq)		Breath:	Resp support
Remove:	When wet (flamm)	Escape: GMFS/SCBAE				
Change:	N.R.					
Provide:	Frostbite					
[Methyl acetylene-propadiene mixture]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin, upper	Eyes:	Eyes, skin, resp sys
Eyes:	Prevent eye contact	100 ppm: SA*	Abs	resp sys	Skin:	
Wash skin:	When contam	250 ppm: SA/CP*/SCBAF/SAF	Ing		Breath:	Water flush immed
Remove:	When wet (flamm)	§ SCBAF PD, PP/SAF PD, PP ASCBA	Con		Swallow:	Resp support
Change:	N.R.	Escape: GMFOV/SCBAE				Medical attention immed
Provide:	Quick drench					
[Methyl acrylate]						
Skin:	Prevent skin contact	TBAL	Inh	Irrit eyes, skin; lac,	Eyes:	Eyes, skin, CNS
Eyes:	Prevent eye contact		Abs	in animals: convuls,	In: Immed	
Wash skin:	When contam		Ing	loss of motor control in	Soap wash immed	
Remove:	When wet (flamm)		Con	hindlimbs	Resp support	
Change:	N.R.				Medical attention immed	
[Methylacrylonitrile]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin, upper	Eyes:	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	2200 ppm: SA/SCBAF	Ing	resp sys, anos	Skin:	CNS
Wash skin:	When contam	§ SCBAF PD, PP/SAF PD, PP ASCBA	Con		Breath:	
Remove:	When wet (flamm)	Escape: GMFOV/SCBAE			Swallow:	Water flush prompt
Change:	N.R.					Resp support
						Medical attention immed
[Methylal]						

Chemical name, structural formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P., IP, Sp. Gr., flammability	VP, FRZ UEL, LEL		
Methyl alcohol CH ₃ OH 67-56-1 PC1400000	Carbinol Columbian spirits, Methanol Pyroigneous spirit, Wood alcohol, Wood naphtha, Wood spirit	NIOSH 200 ppm (260 mg/m ³) ST 250 ppm (325 mg/m ³) [skin] OSHA† 200 ppm (260 mg/m ³)	8000 ppm	Colorless liquid with a character- istic pungent odor	MW 32.1 BP 147°F Sol. Miscible Fl.P. 52°F IP 10.84 eV	VP: 96 mm FRZ -144°F UEL 36% LEL 6.0%	Strong oxidizers	Sigef. Water GC/FID, III [#2000, Methanol]
1230 28	1 ppm = 1.33 mg/m ³				Sp Gr. 0.79 Class IB Flammable Liquid			
Methylamine CH ₃ NH ₂ 74-89-5 PF6300000	Aminomethane, Anhydrous methylamine, Aqueous methylamine, Monomethylamine	NIOSH/OSHA 10 ppm (12 mg/m ³)	100 ppm	Colorless gas with a fish- or ammonia-like odor [Note: A liquid below 21°F Shipped as a liquefied compressed gas]	MW 31.1 BP 21°F Sol. Soluble Fl.P. NA (Gas) 14°F (Liq) IP 8.97 eV RGasD: 1.08 Sp Gr. 0.70 (Liquid at 13°F) Flammable Gas Class IA Flammable Liquid	VP 3.0 atm FRZ -136°F UEL 20.7% LEL 4.9%	Mercury, strong oxidizers, nitromethane [Note: Corrosive to copper & zinc alloys aluminum & galvanized surfaces]	XAD-7, Reagent, HPLC/FID, OSHA [#40]
1061 19 (anhydrous) 1235 68 (aqueous)	1 ppm = 1.29 mg/m ³							
Methyl (n-amy) ketone CH ₃ CO(CH ₂) ₄ CH ₃ 110-43-0 MJ5075000	Amyl methyl ketone, n-Amyl methyl ketone, 2-Heptanone	NIOSH/OSHA 100 ppm (465 mg/m ³)	800 ppm	Colorless to white liquid with a banana-like, fruity odor	MW 114.2 BP 305°F Sol 0.4% Fl.P. 102°F IP 9.33 eV	VP 3 mm FRZ -32°F UEL (250°F) 7.9% LEL (151°F) 11%	Strong acids, alkalis & oxidizers [Note: Will attack some forms of plastic]	Char Meinard/ CS GC/FID, III [#1301, Ketones II]
1110 26	1 ppm = 4.75 mg/m ³				Sp Gr. 0.81 Class II Combustible Liquid			
Methyl bromide CH ₃ Br 74-83-9 PA4900000	Bromomethane, Monobromomethane	NIOSH Ca See Appendix A OSHA† C 20 ppm (80 mg/m ³) [skin]	Ca [250 ppm]	Colorless gas with a chloroform-like odor at high concentrations [Note: A liquid below 38°F Shipped as a liquefied compressed gas]	MW 95.0 BP 38°F Sol 2% Fl.P. NA (Gas) IP 10.54 eV RGasD: 3.38 Sp Gr. 1.73 (Liquid at 32°F) Flammable Gas, but only in presence of a high energy ignition source	VP 1.8 atm FRZ -137°F UEL 16.0% LEL 10%	Aluminum, magnesium, strong oxidizers [Note: Attacks aluminum to form aluminum (methyl) which is SPONTANEOUSLY FLAMMABLE]	Char (pet) (2), CS, GC/FID, III [#2520]
1062 55	1 ppm = 3.95 mg/m ³							

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 6)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irr eyes, skin, upper resp	Eye	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	2000 ppm: SA	Abs	sys; head, drow, dizz, vert,	Skin	CNS, GI tract
Wash skin:	When contam	5000 ppm: SA CF	Ing	li-head, nau, vomit, vis	Breath	
Remove:	When wet (flam)	6000 ppm: SAT/CF/SCBAF/SAF	Con	dist, optic nerve damage (blindness); derm	Swallow	
Change:	N.R.	§ SCBAF PD PP/SAF PD,PP ASCBA				
		Escape SCBAE				
[Methyl alcohol]						
Skin:	Prevent skin contact (soln)/Frostbite	NIOSH/OSHA	Inh	Irr eyes, skin, resp sys,	Eye	Eyes, skin, resp sys
Eyes:	Prevent eye contact (soln)/Frostbite	100 ppm: CCRFS/GMFS/PAPRS/	Abs	cough, skin, muc memb		
Wash skin:	When contam (soln)	§ SCBAF/SAF	(soln)	burns, derm, conj,	Skin	
Remove:	When wet (flam)	§ SCBAF PD PP/SAF PD,PP ASCBA	Ing	liq; frostbite	Breath	
Change:	N.R.	Escape GMFS/SCBAE	(soln)		Swallow	
Provide:	Frostbite		Con (soln/liq)			
[Methylamine]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irr eyes, skin, muc memb,	Eye	Eyes, skin, resp
Eyes:	Prevent eye contact	800 ppm: CCROV*/PAPROV*/GMFOV/	Ing	head, narco, coma, derm	Skin	sys, CNS, PNS
Wash skin:	When contam	§ SA*/SCBAF	Con		Breath	
Remove:	When wet or contam	§ SCBAF PD PP/SAF PD,PP ASCBA			Swallow	
Change:	N.R.	Escape GMFOV/SCBAE				
[Methyl (n-amy) ketone]						
Skin:	Prevent skin contact (liq)	NIOSH	Inh	Irr eyes, skin, resp sys;	Eye	Eyes, skin, resp sys,
Eyes:	Prevent eye contact (liq)	§ SCBAF PD PP/SAF PD,PP ASCBA	Abs	musc weak, inco, vs dist,	Skin	CNS
Wash skin:	When contam (liq)	Escape GMFOV/SCBAE	(liq)	vert, nau, vomit, head,		[In animals: lung, kidney
Remove:	When wet (flam)		Con	mal, hand tremor, convuls,	Breath	& forestomach
Change:	N.R.		(liq)	dysp, skin vesic,		tumors]
Provide:	Quick drench (liq)			liq; frostbite; [carc]		
[Methyl bromide]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOTID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P, IP, Sp, Gr, Flammability	VP, FRZ UEL, LEL		
Methyl Cellosolve® CH ₃ OCH ₂ CH ₂ OH 109-86-4 KL5775000	EGME, Ethylene glycol monomethyl ether, Glycol monomethyl ether, 2-Methoxyethanol	NIOSH 0.1 ppm (0.3 mg/m ³) [skin] OSHA 25 ppm (80 mg/m ³) [skin]	200 ppm	Colorless liquid with a mild, ether-like odor	MW 76.1 BP 256°F Sol Miscible Fl P 102°F IP 9.60 eV	VP 6 mm FRZ -121°F UEL 14% LEL 1.8%	Strong oxidizers, caustics	Char: Methanol/ CH ₃ Cl, GC/FID, III [#1403, Alcohols IV]
1188 26	1 ppm = 3.16 mg/m ³				Sp Gr 0.96 Class II Combustible Liquid			
Methyl Cellosolve® acetate CH ₃ COOCH ₂ CH ₂ OCH ₃ 110-49-6 KL5950000	EGMEA, Ethylene glycol monomethyl ether acetate, Glycol monomethyl ether acetate, 2-Methoxyethyl acetate	NIOSH 0.1 ppm (0.5 mg/m ³) [skin] OSHA 25 ppm (120 mg/m ³) [skin]	200 ppm	Colorless liquid with a mild, ether-like odor	MW 118.1 BP 293°F Sol Miscible Fl P 120°F IP ?	VP 2 mm FRZ -85°F UEL 8.2% LEL 1.7%	Nitrates strong oxidizers, alkalis & acids	Char, CS, GC/FID, III [#1451]
1189 26	1 ppm = 4.91 mg/m ³				Sp Gr 1.01 Class II Combustible Liquid			
Methyl chloride CH ₃ Cl 74-87-3 PA5300000	Chloromethane, Monochloromethane	NIOSH C See Appendix A See Appendix C (Chloroethanes) OSHA† 100 ppm C 200 ppm 300 ppm (5-min max peak in any 3 hrs)	Ca [2000 ppm]	Colorless gas with a faint, sweet odor which is not noticeable at dangerous concentrations [Note: Shipped as a liquefied compressed gas.]	MW 50.5 BP -12°F Sol 0.5% Fl P NA (Gas) IP 11.26 eV	VP 5.0 atm FRZ -144°F UEL 17.4% LEL 8.1%	Chemically-active metals such as potassium, powdered aluminum, zinc & magnesium, water [Note: Reacts with water (hydrolyzes) to form hydrochloric acid.]	Char(2), CH ₃ Cl, GC/FID, III [#1001]
1063 18	1 ppm = 2.10 mg/m ³				RGasD: 1.78 Flammable Gas			
Methyl chloroform CH ₃ CCl ₃ 71-55-6 KJ2975000	Chloroethane, 1,1,1-Trichloroethane, 1,1,1-Trichloroethane (stabilized)	NIOSH C 350 ppm (1900 mg/m ³) [15-min] OSHA† 360 ppm (1900 mg/m ³)	700 ppm	Colorless liquid with a mild, chloroform-like odor	MW 133.4 BP 165°F Sol 0.4% Fl P ? IP 11.00 eV	VP 100 mm FRZ -23°F UEL 12.5% LEL 7.5%	Strong caustics, strong oxidizers, chemically-active metals such as zinc, aluminum, magnesium powders, sodium & potassium, water [Note: Reacts slowly with water to form hydrochloric acid.]	Char, CS, GC/FID, III [#1003, Halo- genated Hydro- carbons]
29 11 11	1 ppm = 5.55 mg/m ³				Sp Gr 1.34 Combustible Liquid, but burns with difficulty			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R. Provide: Quick drench		NIOSH 1 ppm: SA* 2.5 ppm: SA/CF* 5 ppm: SCBAF/SAF 100 ppm: SA/PD,PP* 200 ppm: SAF/PD,PP §: SCBAF/PD,PP/SAF/PD,PP-ASCBA Escape: GMF OV/SCBAE	Inh Abs Ing Con	Irrit eyes, nose, throat; head, drow, weak, ataxia, tremor, som, anemic pallor, in animals: repro, terato effects	Eye: Skin Breath Swallow Inhaled Water flush prompt Resp support Medical attention Inhaled	Eyes, resp sys, CNS, blood, kidneys, repro sys, hemato eye
[Methyl Cellosolve®]						
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R.		NIOSH 1 ppm: SA* 2.5 ppm: SA/CF* 5 ppm: SCBAF/SAF 100 ppm: SA/PD,PP* 200 ppm: SAF/PD,PP §: SCBAF/PD,PP/SAF/PD,PP-ASCBA Escape: GMF OV/SCBAE	Inh Abs Ing Con	Irrit eyes, nose, throat; kidney, brain damage, in animals: narco, repro, terato effects	Eye: Skin Breath Swallow Inhaled Water flush prompt Resp support Medical attention Inhaled	Eyes, resp sys, kidneys, brain, CNS, PNS, repro sys, hemato sys
[Methyl Cellosolve® acetate]						
Skin: Frostbite Eyes: Frostbite Wash skin: N.R. Remove: When wet (flamem) Change: N.R. Provide: Frostbite		NIOSH x SCBAF/PD,PP/SAF/PD,PP-ASCBA Escape: SCBAE	Inh Con (liq)	Dizz, nau, vomit, vis dist, stagger, slurred speech, convuls, coma, liver, kidney damage liq: frostbite, repro, terato effects; [canc]	Eye: Skin Breath Frostbite Frostbite Resp support	CNS, liver, kidneys, repro sys [in animals: lung, kidney & forestomach tumors]
[Methyl chloride]						
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R.		NIOSH/OSHA 700 ppm: SA*/SCBAF §: SCBAF/PD,PP/SAF/PD,PP-ASCBA Escape: GMF OV/SCBAE	Inh Ing Con	Irrit eyes, skin; head, lass, CNS depress, poor equi, derm, card arith; liver damage	Eye: Skin Breath Swallow Inhaled Soap wash prompt Resp support Medical attention Inhaled	Eyes, skin, CNS, CVS, liver
[Methyl chloroform]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Methyl-2-cyano- acrylate <chem>CH3C(CN)COOCH3</chem> 137-06-3 A37000000	Meacrylate, Methyl cyanoacrylate, Methyl α-cyanoacrylate, Methyl ester of 2-cyano- acrylic acid	NIOSH 2 ppm (8 mg/m³) ST 4 ppm (16 mg/m³) OSHA† none	N.D.	Colorless liquid with a characteristic odor.	MW: 111.1 BP: ? Sol: 30% Fl.P: 174°F IP: ?	VP(77°F): 0.2 mm FRZ: ? UEL: ? LEL: ?	Moisture [Note: Contact with moisture causes rapid polymerization.]	KAO-7; CH, CN/ H, PO; HPLC/UV; OSHA [855]
	1 ppm = 4.62 mg/m³				Sp.Gr(81°F): 1.10 Class IIIA Combustible Liquid			
Methylcyclohexane <chem>CH3C6H11</chem> 108-87-2 GV6125000	Cyclohexylmethane, Hexahydrotoluene	NIOSH 400 ppm (1600 mg/m³) OSHA† 800 ppm (2000 mg/m³)	1200 ppm [LEL]	Colorless liquid with a faint, benzene-like odor	MW 98.2 BP 214°F Sol. Insoluble Fl.P. 25°F IP 9.95 eV	VP 37 mm FRZ -196°F UEL 6.7% LEL 1.2%	Strong oxidizers	Char, CS, GC/FID, ■ [#1500, Hydro- carbons]
2296 27	1 ppm = 4.06 mg/m³				Sp.Gr. 0.77 Class IB Flammable Liquid			
Methylcyclohexanol <chem>CH3C6H11OH</chem> 25639-42-3 GW0175000	Hexahydrocresol, Hexahydromethylphenol	NIOSH 50 ppm (235 mg/m³) OSHA† 100 ppm (470 mg/m³)	500 ppm	Straw-colored liquid with a weak odor like coconut oil.	MW 114.2 BP 311-356°F Sol 4% Fl.P 149-158°F IP: 9.80 eV	VP(86°F) 2 mm FRZ -58°F UEL ? LEL ?	Strong oxidizers	Char, CH, Cl, GC/FID, ■ [#5374]
2617 26	1 ppm = 4.75 mg/m³				Sp.Gr. 0.92 Class IIIA Combustible Liquid			
α-Methylcyclohexanone <chem>CH3C6H10O</chem> 583-60-8 GW1750000	2-Methylcyclohexanone	NIOSH 50 ppm (230 mg/m³) ST 75 ppm (345 mg/m³) [skin] OSHA† 100 ppm (460 mg/m³) [skin]	500 ppm	Colorless liquid with a weak, peppermint-like odor	MW 112.2 BP 325°F Sol. Insoluble Fl.P 118°F IP ?	VP: 1 mm FRZ 7°F UEL ? LEL ?	Strong oxidizers	Porapak, Acetone, GC/FID, ■ [#2521]
2297 26	1 ppm = 4.66 mg/m³				Sp.Gr. 0.93 Class II Combustible Liquid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)		Target organs (See Table 6)
Skin:	Prevent skin contact	TBAL	Inh Ing Con	Irrit eyes, skin, nose; blurred vision, lac; rhinids	Eye: Skin: Breath: Swallow:	Ir immed Water wash Resp support Medical attention immed	Eyes, skin, resp sys
Eyes:	Prevent eye contact						
Wash skin:	Daily						
Remove:	N.R.						
Change:	N.R.						
Provide:	Eyewash						
[Methyl-2-cyanoacrylate]							
Skin:	Prevent skin contact	NIOSH 1200 ppm: SA/SCBAF § SCBAF PD PP/SAF PD PP ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, skin, nose, throat, li-head, drow, in animals: narco	Eye Skin Breath Swallow	Ir immed Soap wash prompt Resp support Medical attention immed	Eyes, skin, resp sys, CNS
Eyes:	Prevent eye contact						
Wash skin:	When contam						
Remove:	When wet (flam)						
Change:	N.R.						
[Methylcyclohexane]							
Skin:	Prevent skin contact	NIOSH 500 ppm: SA/SCBAF § SCBAF PD PP/SAF PD PP ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, skin, upper resp sys, head, in animals: narco, liver, kidney damage	Eye Skin Breath Swallow	Ir immed Soap wash prompt Resp support Medical attention immed	Eyes, skin, resp sys, CNS, kidneys, liver
Eyes:	Prevent eye contact						
Wash skin:	When contam						
Remove:	When wet or contam						
Change:	N.R.						
[Methylcyclohexanol]							
Skin:	Prevent skin contact	NIOSH 500 ppm: SA* 600 ppm: SA/GP/SCBAF/SAF § SCBAF PD PP/SAF PD PP ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	In animals: irrit eyes, eyes, muc memb, narco, derm	Eye Skin Breath Swallow	Ir immed Soap wash prompt Resp support Medical attention immed	Skin, resp sys, liver, kidneys, CNS
Eyes:	Prevent eye contact						
Wash skin:	When contam						
Remove:	When wet or contam						
Change:	N.R.						
[o-Methylcyclohexanone]							

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWI unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Methylcyclopenta- dienylmanganese tricarbonyl (as Mn) <chem>CH5C5H5Mn(CO)3</chem> 12108-13-3 OP1450000	Cl-2, Combustion Improver-2, Manganese tricarbonyl- methylcyclopentadienyl, 2-Methylcyclopentadienyl manganese tricarbonyl, MMT	NIOSH 0.2 mg/m³ [skin] OSHA† C 5 mg/m³	N.D.	Yellow to dark- orange liquid with a faint, pleasant odor. [Note: A solid below 36°F.]	MW: 218.1 BP: 449°F Sol: Insoluble FLP: 230°F IP: ? Sp.Gr: 1.39 Class III B Combustible Liquid	VP(212°F): 7mm FRZ: 36°F UEL: ? LEL: ?	Light (decomposes)	None available
Methyl demeton <chem>C4H9O3PS</chem> 8022-00-2 TG1760000	Demeton methyl; O,O-Dimethyl 2-ethylmer- captoethyl thiophosphate; Metasystox®; Methyl mercaptophos; Methyl systox® [(CH₃O)₂P(S)(CH₃)SCH₂CH₃] [(CH₃O)₂P(O)(CH₃)SCH₂CH₃]	NIOSH 0.5 mg/m³ [skin] OSHA† none	N.D.	Oily, colorless to pale-yellow liquid with an unpleasant odor. [Insecticide] [Note: Technical grade consists of 2 isomers: thiono & thio.]	MW: 230.3 BP: Decomposes Sol: 0.03-0.3% FLP: ? IP: ? Sp.Gr: 1.20 Combustible Liquid	VP: 0.0004 mm FRZ: ? UEL: ? LEL: ?	Strong oxidizers, alkalis, water	None available
4,4'-Methylenbis(2- chloroaniline) <chem>CH3C6H4CNH2</chem> 101-14-4 CY1050000	DACPM; 3,3'-Dichloro-4,4'-diamino- diphenylmethane; MBOCA; 4,4'-Methylenbis(o-chloro- aniline); 4,4'-Methylenbis(2-chloro- benzenamine); MOCA 1 ppm = 11.10 mg/m³	NIOSH Ca See Appendix A 0.003 mg/m³ [skin] OSHA† none	Ca [N.D.]	Tan-colored pellets or flakes with a faint, amine-like odor.	MW: 267.2 BP: ? Sol: Slight FLP: ? IP: ? Sp.Gr: 1.44	VP(77°F): 0.00001 mm MLT: 230°F UEL: ? LEL: ?	Chemically active metals (e.g., potassium, sodium, magnesium, zinc)	None available
Methylene bis(4-cyclo- hexylisocyanate) <chem>CH2[HC6H10NCO]2</chem> 5124-30-1 NQ9250000	Dicyclohexylmethane 4,4'- diisocyanate; DMCI; bis(4-isocyanatocyclohexyl)- methane; HMDI; Hydrogenated MDI; Reduced MDI; Saturated MDI 1 ppm = 10.91 mg/m³	NIOSH C 0.01 ppm (0.11 mg/m³) OSHA† none	N.D.	Clear, colorless to light-yellow liquid.	MW: 262.4 BP: ? Sol: Reacts FLP: >395°F IP: ? Sp.Gr(77°F): 1.07 Class III B Combustible Liquid	VP(77°F): 0.001 mm FRZ: <14°F UEL: ? LEL: ?	Water, ethanol, alcohols, amines, bases, acids, organotin catalysts [Note: May slowly polymerize if heated above 122°F.]	None available

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	Prevent skin contact	TBAL	Inh	Irrit eyes; gidd, nau, head;	Eye:	Eyes, CNS, liver,
Eyes:	Prevent eye contact		Abs	In animals: tremor, severe	Skin:	kidneys
Wash skin:	When contam		Ing	clonic spasms, weak, slow	Breath:	
Remove:	When wet or contam		Con	respiration; liver, kidney inj	Swallow:	
Change:	N.R.					

[Methyl cyclopentadienyl manganese tricarbonyl (as Mn)]

Skin:	Prevent skin contact	TBAL	Inh	Irrit eyes, skin; ache eyes,	Eye:	Eyes, skin, resp sys,
Eyes:	Prevent eye contact		Abs	rhin, nau, head, dizz, vomit	Skin:	CNS, CVS, blood chol
Wash skin:	When contam		Ing		Breath:	
Remove:	When wet or contam		Con		Swallow:	
Change:	Daily					
Provide:	Eyewash, Quick drench					

[Methyl demeton]

Skin:	Prevent skin contact	NIOSH	Inh	Hema, cyan, nau, methemo,	Eye:	Liver, blood, kidneys
Eyes:	Prevent eye contact	#: SCBAF:PD,PP/SAF:PD,PP:ASCBA	Abs	kidney irrit; [carc]	Skin:	[In animals: liver,
Wash skin:	When contam/Daily	Escape: GMFOVHIE/SCBAE	Ing		Breath:	lung & bladder
Remove:	When wet or contam		Con		Swallow:	tumors]
Change:	Daily					
Provide:	Eyewash, Quick drench					

[4,4'-Methylenbis(2-chloroaniline)]

Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, skin, resp sys;	Eye:	Eyes, skin, resp sys
Eyes:	Prevent eye contact	0.1 ppm: SA*	Ing	skin, resp sys; chest tight,	Skin:	
Wash skin:	When contam	0.25 ppm: SA-CF*	Con	dysp, cough, dry throat,	Breath:	
Remove:	When wet or contam	0.5 ppm: SCBAF/SAF		wheez, pulm edema; skin	Swallow:	
Change:	N.R.	1 ppm: SAF:PD,PP		blisters		
Provide:	Quick drench	§: SCBAF:PD,PP/SAF:PD,PP:ASCBA				
		Escape: GMFOV/SCBAE				

[Methylene bis(4-cyclohexylisocyanate)]

Chemical name, structure/formula, CAS and RTECS Nos., and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL, F.P., IP, Sp. Gr., Flammability	VP, FRZ UEL, LEL		
Methylene bisphenyl isocyanate $\text{CH}_2(\text{C}_6\text{H}_4\text{NCO})_2$ 101-68-8 NQ9350000	4,4'-Diphenylmethane diisocyanate, MDI, Methylene bis(4-phenyl isocyanate), Methylene di-p-phenylene ester of isocyanic acid	NIOSH 0.05 mg/m ³ (0.005 ppm) C 0.2 mg/m ³ (0.020 ppm) [10-min] OSHA C 0.2 mg/m ³ (0.02 ppm)	75 mg/m ³	White to light- yellow, odorless flakes [Note: A liquid above 99°F]	MW: 250.3 BP: 597°F Sol: 0.2% F.P.: 390° IP: 7 Sp. Gr: 1.23 (Solid at 77°F) 1.19 (Liquid at 122°F) Combustible Solid	VP(77°F): 0.000005 mm MLT: 99°F UEL: 7 LEL: 7	Strong alkalis, acids, alcohol [Note: Polymerizes at 450°F.]	Bub. Acetylate, HPLC/UV/D, III [#5521]
Methylene chloride CH_2Cl_2 75-09-2 PA8050000	Dichloromethane, Methylene dichloride	NIOSH Ca See Appendix A OSHA 500 ppm C 1000 ppm 2000 ppm (5-min max peak in any 2 hrs)	Ca [2300 ppm]	Colorless liquid with a chloroform- like odor [Note: A gas above 104°F.]	MW: 84.9 BP: 104°F Sol: 2% F.P.: ? IP: 11.32 eV Sp. Gr: 1.33 Combustible Liquid	VP: 350 mm FRZ: -139°F UEL: 23% LEL: 13%	Strong oxidizers, caustics, chemically- active metals such as aluminum, magnesium, powders, potassium & sodium, concentrated nitric acid	Char(2), CS, GC/FID, III [#1005]
4,4'-Methylene- diamine $\text{CH}_2(\text{C}_6\text{H}_4\text{NH}_2)_2$ 101-77-8 BY5426000	4,4'-Diaminodiphenylmethane; para, para'-Diaminodiphenyl- methane; Diaminomethane; 4,4'-Diphenylmethanediamine; MDA	NIOSH Ca See Appendix A OSHA [1818.1000] 0.010 ppm ST 0.100 ppm	Ca [N.D.]	Pale-brown, crystalline solid with a faint, amine-like odor.	MW: 188.3 BP: 748°F Sol: 0.1% F.P.: 374°F IP: 10.70 eV Sp. Gr: 1.06 (Liquid at 212°F) Combustible Solid	VP(77°F): 0.0000002 mm MLT: 196°F UEL: 7 LEL: 7	Strong oxidizers	Filter; Reagent; HPLC/UV/D; III [#5029]
Methyl ethyl ketone peroxide $\text{C}_5\text{H}_{10}\text{O}_4$ 1336-23-4 EL9460000 2127 49 (80% MEKP) 2650 81	2-Butanone peroxide, Ethyl methyl ketone peroxide, MEKP, MEK peroxide, Methyl ethyl ketone hydroperoxide	NIOSH C 0.2 ppm (1.6 mg/m ³) OSHA† none	N.D.	Colorless liquid with a character- istic odor. [Note: Explosive decomposition occurs at 230°F.]	MW: 176.2 BP: 244°F (Decomposes) Sol: Soluble F.P.(oc): 125-200°F (80% MEKP) IP: ? Sp. Gr(59°F): 1.12 Combustible Liquid	VP: ? FRZ: ? UEL: 7 LEL: 7	Organic materials, heat, flames, sunlight, trace contaminants Via; [Note: A strong oxidiz- ing agent. Pure MEKP is shock sensitive. Commercial product is diluted with 40% dimethylphthalate, cyclohexane peroxide, or diallylphthalate to reduce sensitivity to shock.]	Imp; Reagent; Via; III [#3508]

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 5)	Target organs (See Table 5)	
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet or contam Daily	NIOSH 0.5 mg/m ³ : SA* 1.25 mg/m ³ : SA:CP* 2.5 mg/m ³ : SCBAF/SAF 75 mg/m ³ : SAF PD,PP 5 SCBAF PD PP/SAF PD PP ASCBA Escape: GMFOVHE/SCBAE	Inh Ing Con	Irrit eyes, nose, throat, resp sens, cough, pulm secretions, chest pain, dysp, asthma	Eye Skin Breath Swallow	Imm med Soap wash imm ed Resp support Medical attention imm ed	Eyes, resp sys
[Methylene bisphenyl isocyanate]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R. Eyewash, Quick drench	NIOSH 1/2 SCBAF PD PP/SAF PD PP ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, skin, itg weak, som, li-head numb tingle limbs, nau, [canc]	Eye Skin Breath Swallow	Imm med Soap wash prompt Resp support Medical attention imm ed	Eyes, skin, CVS, CNS [in animals: lung, liver, salivary & mammary gland tumors]
[Methylene chloride]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam/Daily When wet or contam Daily Eyewash, Quick drench	NIOSH 1/2 SCBAF PD,PP/SAF PD,PP/ASCBA Escape: GMFOVHE/SCBAE	Inh Abs Ing Con	Irrit eyes; jaun, hepatitis; myocardial damage; in animals: heart, liver, spleen damage; [canc]	Eye: Skin: Breath: Swallow;	Imm med Soap wash imm ed Resp support Medical attention Imm ed	Eyes, liver, CVS, spleen [in animals: bladder cancer]
[4,4'-Methylenedianiline]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R. Eyewash, Quick drench	TBAL	Inh Ing Con	Irrit eyes, skin, nose, throat; cough, dysp, pulm edema, blurred vision; blisters, scars skin; abdom pain, vomit, diarr; darm; in animals: liver, kidney damage	Eye: Skin: Breath: Swallow:	Imm med Water wash imm ed Resp support Medical attention Imm ed	Eyes, skin, resp sys, liver, kidneys
[Methyl ethyl ketone peroxide]							

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl, P, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Methyl formate <chem>HCOOCH3</chem> 107-31-3 LQ8925000	Methyl ester of formic acid, Methyl methanoate	NIOSH 100 ppm (250 mg/m ³) ST 150 ppm (375 mg/m ³) OSHA† 100 ppm (250 mg/m ³)	4500 ppm	Colorless liquid with a pleasant odor [Note: A gas above 89°F.]	MW 60.1 BP 89°F Sol 30% Fl P -2°F IP 10.82 eV	VP 476 mm FRZ -148°F UEL 23% LEL 45%	Strong oxidizers [Note: Reacts slowly with water to form methanol & formic acid.]	Carbo-B(2), Ethyl acetate, GC/FID, II(5) [#8291]
1243 26	1 ppm = 2.50 mg/m ³				Sp Gr 0.98 Class IA Flammable Liquid			
5-Methyl-3-heptanone <chem>C6H13OCH2CH(CH3)CH2CH3</chem> 541-85-5 MJ7350000	Amyl ethyl ketone, Ethyl amyl ketone, 3-Methyl-5-heptanone	NIOSH/OSHA 25 ppm (130 mg/m ³)	100 ppm	Colorless liquid with a pungent odor.	MW 128.2 BP 315°F Sol Insoluble Fl P 138°F IP ?	VP 2 mm FRZ -70°F UEL ? LEL ?	Strong oxidizers	Char. Methanol/ CS, GC/FID, III [#1301 Ketones II]
2271 26	1 ppm = 5.33 mg/m ³				Sp Gr 0.82 Class II Combustible Liquid			
Methyl hydrazine <chem>CH3NHNH2</chem> 50-34-4 MV5600000	MMH, Monomethylhydrazine	NIOSH Ca See Appendix A C 0.04 ppm (0.08 mg/m ³) (2-hr) OSHA C 0.2 ppm (0.35 mg/m ³) [skin]	Ca [20 ppm]	Fuming, colorless liquid with an ammonia-like odor.	MW 46.1 BP 190°F Sol Miscible Fl P 17°F IP 8.00 eV	VP 38 mm FRZ -62°F UEL 92% LEL 2.5%	Oxides of iron, copper, manganese, lead, copper alloys, porous materials such as earth, asbestos, wood & cloth, strong oxidizers such as fluorine & chlorine, nitric acid, hydrogen peroxide	Bub. Pho-acid, Vis, ■ [#3610]
1244 57	1 ppm = 1.92 mg/m ³				Sp Gr(77°F) 0.87 Class IB Flammable Liquid			
Methyl iodide <chem>CH3I</chem> 74-88-4 PA9450000	Iodomethane, Moniodomethane	NIOSH Ca See Appendix A 2 ppm (10 mg/m ³) [skin] OSHA† 8 ppm (28 mg/m ³) [skin]	Ca [100 ppm]	Colorless liquid with a pungent, ether-like odor. [Note: Turns yellow, red, or brown on exposure to light & moisture.]	MW 141.9 BP 109°F Sol 1% Fl P NA IP 9.54 eV	VP 400 mm FRZ -88°F UEL NA LEL NA	Strong oxidizers [Note: Decomposes at 518°F.]	Char. Toluene, GC/FID, III [#1014]
2644 55	1 ppm = 5.90 mg/m ³				Sp Gr 2.28 Noncombustible Liquid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Routes	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skln:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, nose, chest	Eye:	Eyes, resp sys, CNS
Eyes:	Prevent eye contact	1000 ppm: SA*	Abs	tight, dysp, vis dist.	Skin:	
Wash skin:	When contam	2500 ppm: SA, CF*	Inh	CNS depres.	Breath:	Resp support
Remove:	When wet (flam)	4500 ppm: SCBAF/SAF	Con	in animals: pulm edema;	Swallow:	Medical attention
Change:	N.R.	§ SCBAF PD, PP/SAF PD, PP ASCBA		narco	Immed	Immed
		Escape: GMFOV/SCBAE				
[Methyl formate]						
Skln:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin, muc memb.	Eye:	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	100 ppm: CCROV*/PAPROV*/GMFOV/	Abs	head, narco, coma, dem	Skin:	CNS
Wash skin:	When contam	SA*/SCBAF	Inh		Breath:	
Remove:	When wet or contam	§ SCBAF PD, PP/SAF PD, PP ASCBA	Con		Swallow:	
Change:	N.R.	Escape: GMFOV/SCBAE				
[5-Methyl-3-heptanone]						
Skln:	Prevent skin contact	NIOSH	Inh	Irrit eyes, skin, resp sys;	Eye:	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	§ SCBAF PD, PP/SAF PD, PP ASCBA	Abs	vomit, diarr, tremor,	Skin:	CNS, liver, blood,
Wash skin:	When contam	Escape: SCBAE	Inh	ataxia, anoxia, cyan,	Breath:	CNS
Remove:	When wet (flam)		Con	convuls, [carc]	Swallow:	[in animals:
Change:	N.R.					lung, liver,
Provide:	Eyewash, Quick drench					blood vessel
						& intestine
						tumors]
[Methyl hydrazine]						
Skln:	Prevent skin contact	NIOSH	Inh	Irrit eyes, skin, resp sys;	Eye:	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	§ SCBAF PD, PP/SAF PD, PP ASCBA	Abs	naus, vomit, vert, ataxia,	Skin:	CNS
Wash skin:	When contam	Escape: GMFOV/SCBAE	Inh	slurred speech, drow,	Breath:	[in animals:
Remove:	When wet or contam		Con	derm, [carc]	Swallow:	lung, kidney
Change:	N.R.					& forestomach
Provide:	Eyewash, Quick drench					tumors]
[Methyl iodide]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL F.P., IP, Sp. Gr., flammability	VP, FRZ UEL, LEL		
Methyl isobutyl ketone <chem>CH3COCH2CH2CH(CH3)2</chem> 110-12-3 MP3880000	Isobutyl methyl ketone, isopentyl methyl ketone, 2-Methyl-5-hexanone, 5-Methyl-2-hexanone, MIAK	NIOSH 50 ppm (240 mg/m ³) OSHA† 100 ppm (475 mg/m ³)	N.D.	Colorless, clear liquid with a pleasant, fruity odor.	MW: 114.2 BP: 291°F Sol: 0.5% F.P.: 97°F IP: 9,284 eV	VP: 5 mm FRZ: -101°F UEL(200°F): 8.2% LEL(200°F): 1.0%	Oxidizers	None available
2302 26	1 ppm = 4.75 mg/m ³				Sp. Gr: 0.81 Class IC Flammable Liquid			
Methyl isobutyl carbinol <chem>(CH3)2CHCH2CH(OH)CH3</chem> 108-11-2 SA7350000	Isobutylmethylcarbinol, Methyl amyl alcohol, 4-Methyl-2-pentanol, MIBC	NIOSH 25 ppm (100 mg/m ³) ST 40 ppm (165 mg/m ³) [skin] OSHA† 25 ppm (100 mg/m ³) [skin]	400 ppm	Colorless liquid with a mild odor	MW 102.2 BP 271°F Sol 2% F.P. 106°F IP ?	VP 3 mm FRZ: -130°F UEL 5.5% LEL 1.0%	Strong oxidizers	Char. 2-Propanol/ CS, GC/FID; III [#1402, Alcohols III]
2053 26	1 ppm = 4.25 mg/m ³				Sp. Gr. 0.81 Class II Combustible Liquid			
Methyl isocyanate <chem>CH3NCO</chem> 624-83-9 NQ9450000	Methyl ester of isocyanic acid, MIC	NIOSH/OSHA 0.02 ppm (0.05 mg/m ³) [skin]	3 ppm	Colorless liquid with a sharp pungent odor	MW 57.1 BP 139°F Sol 459°F) 0% F.P. 19°F IP 10.67 eV	VP 348 mm FRZ: -49°F UEL 26% LEL 5.3%	Water, oxidizers, acids, alkalis, amines, iron, tin, copper [Note: Usually con- tains inhibitors to prevent polymeri- zation.]	XAD-7, CH3CN, HP[C/F/LD, OSHA [#54]
2480 30	1 ppm = 2.37 mg/m ³				Sp. Gr. 0.96 Class IB Flammable Liquid			
Methyl isopropyl ketone <chem>CH3COCH2CH(CH3)2</chem> 563-80-4 EL9100000	2-Acetyl propane, isopropyl methyl ketone, 3-Methyl-2-butanone, 3-Methyl butan-2-one, MIPK	NIOSH 200 ppm (795 mg/m ³) OSHA† none	N.D.	Colorless liquid with an acetone- like odor.	MW: 86.2 BP: 199°F Sol: Very slight F.P.: 7 IP: 9.32 eV	VP: 42 mm FRZ: -134°F UEL: ? LEL: 7	Oxidizers	None available
2387 26	1 ppm = 3.51 mg/m ³				Sp. Gr: 0.81 Combustible Liquid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)	
Skin:	Prevent skin contact	NIOSH 500 ppm: CCRGV/SA* 1250 ppm: SA:CF/PAPROV* 2500 ppm: CCRFOV/GMFOV/PAPRTOV/ SAT:CF*/SCBAF/SAF 5000 ppm: SAF:PD,PP §: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irr: eyes, skin, muc memb; head, narco, coma; dermat; in animals: liver, kidney damage	Eye:	Irr: Irrimed Soap flush prompt Resp support Medical attention Irrimed	Eyes, skin, resp sys, CNS, liver, kidneys
Eyes:	Prevent eye contact				Skin:		
Wash skin:	When contam				Breath:		
Remove:	When wet (flam)				Swallow:		
Change:	N.R.						
[Methyl isocetyl ketone]							
Skin:	Prevent skin contact	NIOSH/OSHA 250 ppm: SA* 400 ppm: SA:CF*/SCBAF/SAF §: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irr: eyes, skin; head, drow, dermat; in animals: narco	Eye:	Irr: Irrimed Water flush prompt Resp support Medical attention Irrimed	Eyes, skin, CNS
Eyes:	Prevent eye contact				Skin:		
Wash skin:	When contam				Breath:		
Remove:	When wet or contam				Swallow:		
Change:	N.R.						
[Methyl isobutyl carbamate]							
Skin:	Prevent skin contact	NIOSH/OSHA 0.2 ppm: SA* 0.5 ppm: SA:CF* 1 ppm: SCBAF/SAF 3 ppm: SAF:PD,PP §: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irr: eyes, skin, nose, throat; resp sens, cough, pulm secretions, chest pain, dysp, asthma, eye, skin damage; in animals: pulm edema	Eye:	Irr: Irrimed Water flush immed Resp support Medical attention Irrimed	Eyes, skin, resp sys
Eyes:	Prevent eye contact				Skin:		
Wash skin:	When contam				Breath:		
Remove:	When wet (flam)				Swallow:		
Change:	N.R.						
Provide:	Eyewash, Quick drench						
[Methyl isocyanate]							
Skin:	Prevent skin contact	TBAL	Inh Ing Con	Irr: eyes, skin, muc memb; resp sys; cough	Eye:	Irr: Irrimed Soap wash Irrimed Resp support Medical attention Irrimed	Eyes, skin, resp sys
Eyes:	Prevent eye contact				Skin:		
Wash skin:	When contam				Breath:		
Remove:	When wet or contam				Swallow:		
Change:	N.R.						
[Methyl isopropyl isocyanide]							

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL, FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Methyl mercaptan <chem>CH3SH</chem> 74-93-1 PB4375000	Mercaptomethane, Methanethiol, Methyl sulphydrate	NIOSH C 0.5 ppm (1 mg/m ³) [15-min] OSHA† C 10 ppm (20 mg/m ³)	150 ppm	Colorless gas with a disagreeable odor like garlic or rotten cabbage. [Note: A liquid below 43°F. Shipped as a liquefied compressed gas.]	MW: 48.1 BP: 43°F Sol: 2% FLP: NA (Gas) (oc) 0°F (Liq) IP: 9.44 eV RQSD: 1.66 Sp Gr: 0.90 (Liquid at 32°F) Flammable Gas Class 1A Flammable Liquid	VP: 1.7 atm FRZ: -186°F UEL: 21.8% LEL: 3.9%	Strong oxidizers, bleaches, copper, aluminum, nickel- copper alloys	Filter* HCl/DCE, GC/FPD, IR [#2542]
1064 13	1 ppm = 2.00 mg/m ³							
Methyl methacrylate <chem>CH2=C(CH3)COOCH3</chem> 80-62-6 OZ5075000	Methacrylate monomer, Methyl ester of methacrylic acid, Methyl-2-methyl-2-propenoate	NIOSH/OSHA 100 ppm (410 mg/m ³)	1000 ppm	Colorless liquid with an acid, fruity odor	MW: 100.1 BP: 214°F Sol: 1.5% FLP (oc): 50°F IP: 9.70 eV	VP: 29 mm FRZ: -54°F UEL: 8.2% LEL: 1.7%	Nitrates, oxidizers, peroxides, strong alkalis, moisture [Note: May polymerize if subjected to heat, oxidizers, or ultraviolet light. Usually contains an inhibitor such as hydroquinone.]	XAD-2, CS, GC/FPD, IR [#2537]
1247 26 (inhibited)	1 ppm = 4.16 mg/m ³				Sp Gr: 0.94 Class 1B Flammable Liquid			
Methyl parathion <chem>(CH3O)2P(S)(OC2H5)2</chem> 298-00-0 TG0175000	Azophos®; O,O-Dimethyl-O-p-nitro- phenylphosphorothioate; Parathion methyl	NIOSH 0.2 mg/m ³ [skin] OSHA† none	N.D.	White to tan, crystalline solid or powder with a pungent, garlic- like odor. [pesticide] [Note: The commer- cial product in xylene is a tan liquid.]	MW: 263.2 BP: 289°F Sol(77°F): 0.006% FLP: 7 IP: 7	VP: 0.00001 mm MLT: 99°F UEL: 7 LEL: 7	Strong oxidizers, water [Note: Explosive risk when heated above 122°F.]	None available
2783 66					Sp Gr: 1.36 Combustible Solid			
Methyl silicate <chem>(CH3O)2Si</chem> 681-84-5 VV9800000	Methyl orthosilicate, Tetramethoxysilane, Tetramethyl ester of silicic acid, Tetramethyl silicate	NIOSH 1 ppm (6 mg/m ³) OSHA† none	N.D.	Clear, colorless liquid. [Note: A solid below 28°F.]	MW: 152.3 BP: 250°F Sol: Soluble FLP: 205°F IP: 7	VP(77°F): 12 mm FRZ: 28°F UEL: 7 LEL: 7	Oxidizers; hexa- fluorides of rhenium, molybdenum & tungsten	None available
2248 29	1 ppm = 8.37 mg/m ³				Sp Gr: 1.02 Class 1B Combustible Liquid			

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL, F.P., IP, Sp, Gr, flammability	VP, FRZ, UEL, LEL		
α-Methyl styrene $C_9H_8(CH_3)=CH_2$ 98-83-9 WL5250000	AMS, Isopropenyl benzene 1-Methyl-1-phenylethylene, 2-Phenyl propylene 1 ppm = 4.91 mg/m ³	NIOSH 50 ppm (240 mg/m ³) ST 100 ppm (485 mg/m ³) OSHA† C 100 ppm (480 mg/m ³)	700 ppm	Colorless liquid with a characteristic odor	MW 118.2 BP 330°F Sol: Insoluble F.P. 129°F IP 8.35 eV Sp Gr 0.91 Class II Combustible Liquid	VP 2 mm FRZ -10°F UEL 6.1% LEL 1.9%	Oxidizers, peroxides, halogens, catalysts for vinyl or ionic polymers, aluminum, iron chloride, copper [Note: Usually contains an inhibitor such as tert-butyl catechol.]	Char. CS, GC/FID, III [#1501, Aromatic Hydrocarbons]
Metribuzin $C_9H_{10}N_4O_5$ 21087-64-9 XZ2990000	4-Amino-6-(1,1-dimethyl-ethyl)-3-(methylthio)-1,2,4-triazin-5(4H)-one; Sencor®	NIOSH 5 mg/m ³ OSHA† none	N.D.	Colorless, crystalline solid, [herbicide]	MW: 214.3 BP: ? Sol: 0.1% F.P.: NA IP: ? Sp Gr: 1.31 Noncombustible Solid	VP: 0.0000004 mm MLT: 257°F UEL: NA LEL: NA	None reported	None available
Mica (containing less than 1% quartz) 12001-26-2 VV8760000	Biotite, Lepidolite, Margarite, Muscovite, Phlogopite, Roscovite, Zinnwaldite	NIOSH 3 mg/m ³ (resp) OSHA† 20 mppcf	1500 mg/m ³	Colorless, odorless flakes or sheets of hydrous silicates	MW: 797 (approx) BP: ? Sol: Insoluble F.P.: NA IP: NA Sp Gr: 2.6-3.2 Noncombustible Solid	VP: 0 mm (approx) MLT: ? UEL: NA LEL: NA	None reported	Filter, none; Grav. III [#0600, nuisance Dust resp])
Mineral wool fiber PY8070000	Manmade mineral fibers, Rock wool, Slag wool, Synthetic vitreous fibers [Note: Produced by blowing steam or air through molten rock (rock wool) or various furnace slags that are by-products of metal smelting or refining processes (slag wool).]	NIOSH 3 fibers/cm ³ (fibers < 3.5 µm diameter & ≥ 10 µm in length) 5 mg/m ³ (total) OSHA 15 mg/m ³ (total) 8 mg/m ³ (resp)	N.D.	Typically, a mineral "wool" with diameters >0.5 µm & >1.5 µm in length.	MW: varies BP: NA Sol: Insoluble F.P.: NA IP: NA Sp Gr: ? Noncombustible Fibers	VP: 0 mm (approx) MLT: 2 UEL: NA LEL: NA	None reported	Filter, none; Grav. II [#0500, nuisance Dust (total)] [Also #7400.]

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	Prevent skin contact	NIOSH	Inh	Irr eyes, skin, nose,	Eye	Eye, skin, resp sys.
Eyes:	Prevent eye contact	500 ppm: CCROV*/SA*	Inh	throat, drow, derm	Skin	CNS
Wash skin:	When contam	700 ppm: SA:CF*/CCRFV/GMFOV/ PAPROV*/SCBAF/SAF	Con		Breath	
Remove:	When wet or contam	§ SCBAF PD,PP/SAF PD,PP ASCBA			Swallow	
Change:	N.R.	Escape: GMFOV/SCBAE				
[α-Methyl styrene]						
Skin:	Prevent skin contact	TBAL	Inh	In animals: CNS depress;	Eye:	CNS, thyroid, liver
Eyes:	N.R.		Inh	thyroid, liver, enzyme	Skin:	
Wash skin:	When contam/Daily		Con	changes	Breath:	
Remove:	When wet or contam				Swallow:	
Change:	Daily					
[Methiocarb]						
Skin:	N.R.	NIOSH	Inh	Irrit eyes; pneumoconiosis,	Eye	Resp sys
Eyes:	N.R.	15 mg/m ³ DM	Con	cough, dysp, weak, low-wgt	Breath	
Wash skin:	N.R.	30 mg/m ³ DMXSO/SA				
Remove:	N.R.	75 mg/m ³ SA:CF/PAPROD				
Change:	N.R.	150 mg/m ³ HIEF/SAT CF/PAPRTHIE/ SCBAF/SAF				
		1500 mg/m ³ SA PD,PP				
		§ SCBAF PD,PP/SAF PD,PP ASCBA				
		Escape: HIEF/SCBAE				
[Mica (containing less than 1% quartz)]						
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, skin, resp sys;	Eye:	Eye, skin, resp sys
Eyes:	Prevent eye contact	6X REL: D	Con	dysp	Skin:	
Wash skin:	Daily	10X REL: DXSO/HIE/SA			Breath:	
Remove:	N.R.	25X REL: SA:CF/PAPROD				
Change:	Daily	60X REL: HIEF/PAPRTHIE/SCBAF/SAF 1000X REL: SAF PD,PP				
		§ SCBAF PD,PP/SAF PD,PP ASCBA				
		Escape: HIEF/SCBAE				
[Mineral Wool]						

Chemical name, structural formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL F.P., IP, Sp. Gr, flammability	VP, FRZ UEL, LEL		
Molybdenum Mo 7439-98-7 QA4680000	Molybdenum metal	NIOSH* See Appendix D OSHA† 15 mg/m³ [*Note: The REL and PEL also apply to other insoluble molybdenum compounds (as Mo).]	5000 mg/m³ (as Mo)	Dark gray or black powder with a metallic luster.	MW: 95.9 BP: 871°F Sol: Insoluble F.P.: NA IP: NA Sp Gr: 10.28 Combustible Solid in form of dust or powder.	VP: 0 mm (approx) MLT: 4752°F UEL: NA LEL: NA	Strong oxidizers	Filter, Acid, ICP, III [#7300, Elements]
Molybdenum (soluble compounds, as Mo)	Synonyms vary depending upon the specific soluble molybdenum compound.	NIOSH See Appendix D OSHA 5 mg/m³	1000 mg/m³ (as Mo)	Appearance and odor vary depending upon the specific soluble molybdenum compound.	Properties vary depending upon the specific soluble molybdenum compound.		Varies	Filter, Acid, ICP, III [#7300, Elements]
Monocrotophos $C_8H_{11}NO_6P$ 6923-22-4 TC4375000	3-Hydroxy-N-methylcrotona- mide dimethylphosphate, Monocron [[CH ₃ O] ₂ P(O)OC(CH ₃)= CHC(O)NHCH ₃]	NIOSH 0.25 mg/m³ OSHA† none	N.D.	Colorless to reddish-brown solid with a mild, ester odor. [Insecticide]	MW: 223.2 BP: 257°F Sol: Miscible F.P.: > 200°F IP: ? Sp.Gr: ? Combustible Solid	VP: 0.000007 mm MLT: 129°F UEL: ? LEL: ?	Metals, low molecular weight alcohols & glycols [Note: Corrosive to black iron, drum steel, stainless steel 304 & brass. Should be stored at 70-80°F.]	None available
2783 55 (organophosphorus pesticide, n.o.s.)								
Monomethyl aniline $C_8H_9NHCH_3$ 100-61-8 BY4550000	MA, (Methylamino)benzene, N-Methyl aniline, Methylphenylamine, N-Phenylmethylamine	NIOSH 0.5 ppm (2 mg/m³) [skin] OSHA† 2 ppm (8 mg/m³) [skin]	100 ppm	Yellow to light- brown liquid with a weak, ammonia- like odor.	MW: 107.2 BP: 384°F Sol: Insoluble F.P. 175°F IP: 7.32 gV Sp Gr: 0.99 Class IIIA Combustible Liquid	VP: 6.3 mm FRZ: -71°F UEL: ? LEL: ?	Strong acids, strong oxidizers	Bub. NaOH, GC/FID, III [#S153]
2294 57	1 ppm = 4.46 mg/m³							

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	N.R.	OSHA	Inh	In animals: irrit eyes	Eye:	Eyes, resp sys,
Eyes:	N.R.	75 mg/m ³ DM*	Inh	nose throat and/or diarr.	Breath:	liver, kidneys
Wash skin:	N.R.	150 mg/m ³ DMXSO*/SA	Inh	low-wgt., listlessness	Swallow	
Remove:	N.R.	375 mg/m ³ SA CF/PAPRDM*	Con	liver, kidney damage		
Change:	N.R.	750 mg/m ³ HIEF/SAT CF/PAPRTHIE/ SCBAF/SAF 5000 mg/m ³ SA PD,PP § SCBAF PD,PP/SAF PD,PP ASCBA Escape HIEF/SCBAE				
[Molybdenum]						
Skin:	Prevent skin contact	OSHA	Inh	In animals: irrit eyes	Eye:	Eyes, resp sys,
Eyes:	Prevent eye contact	25 mg/m ³ DM*	Inh	nose throat and/or, mco.	Water flush	kidneys, blood
Wash skin:	When contam	50 mg/m ³ DMXSO*/SA*	Inh	dysp. anemia	Breath:	
Remove:	When wet or contam	125 mg/m ³ SA CF*/PAPRDM*	Con		Swallow	
Change:	N.R.	250 mg/m ³ HIEF/SAT CF*/PAPRTHIE*/ SCBAF/SAF 1000 mg/m ³ SAF PD,PP § SCBAF PD,PP/SAF PD,PP ASCBA Escape HIEF/SCBAE				
[Molybdenum (soluble compounds, as Mo)]						
Skin:	Prevent skin contact	TBAL	Inh	Irrit eyes, miosis, blurred	Eye:	Eyes, resp sys, CNS,
Eyes:	Prevent eye contact		Abs	vision; dizz, convuls; dysp;	Swallow	CVS, blood chol,
Wash skin:	When contam		Inh	saliv, abdom cramps, nau,	Breath:	nopro sys
Remove:	When wet or contam		Con	diarr; vomit;	Medical attention	
Change:	Daily			In animals: possible terato effects	Immed	
[Monocrotaphos]						
Skin:	Prevent skin contact	NIOSH	Inh	Weak daz; head dysp.	Eye:	Resp sys, liver
Eyes:	Prevent eye contact	5 ppm SA	Abs	cyan methemo pulm	Skin:	kidneys, blood, CNS
Wash skin:	When contam	12.5 ppm SA CF	Inh	edema liver, kidney	Breath:	
Remove:	When wet or contam	25 ppm SAT CF/SCBAF/SAF	Con	damage	Swallow	
Change:	N.R.	100 ppm SAF PD,PP § SCBAF PD,PP/SAF PD,PP ASCBA Escape GMFS/SCBAE				
[Monomethyl aniline]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL F.P., IP, Sp. Gr., flammability	VP, FRZ UEL, LEL		
Morpholine C_4H_9ON 110-91-8 QD6475000	Diethylene midoxide; Diethylene oxide; Tetrahydro-1,4-oxazine; Tetrahydro-p-oxazine	NIOSH 20 ppm (70 mg/m ³) ST 30 ppm (105 mg/m ³) [skin] OSHA† 20 ppm (70 mg/m ³) [skin]	1400 ppm [LEL]	Colorless liquid with a weak ammonia- or fish- like odor [Note: A solid below 23°F.]	MW 87.1 BP 264°F Sol: Miscible F.P.(oc): 96°F IP 8.88 eV	VP 6 mm FRZ 23°F UEL 11.2% LEL 1.4%	Strong acids, strong oxidizers, metals, nitro compounds [Note: Corrosive to metals.]	Si gel; H ₂ SO ₄ /NaOH; GC/FID; II(3) [#S150]
1760 80 (aqueous) 2054 29	1 ppm = 3.62 mg/m ³				Sp.Gr: 1.007 Class IC Flammable Liquid			
Naphtha (coal tar) 8030-30-8 DE3030000	Crude solvent coal tar naphtha; High solvent naphtha; Naphtha	NIOSH/OSHA 100 ppm (400 mg/m ³)	1000 ppm [LEL]	Reddish-brown, mobile liquid with an aromatic odor	MW 110 (approx) BP 320-428°F Sol: Insoluble F.P 100-109°F IP ?	VP <5 mm FRZ ? UEL ? LEL ?	Strong oxidizers	Char; CS; GC/FID; III [#1550]
1256 27 (solvent) 2553 27	1 ppm = 4.57 mg/m ³ (approx)				Sp Gr: 0.89-0.97 Class II Combustible Liquid			
Naphthalene $C_{10}H_8$ 91-20-3 QJ0525000	Naphthalin; Tar camphor; White tar	NIOSH 10 ppm (50 mg/m ³) ST 15 ppm (75 mg/m ³) OSHA† 10 ppm (50 mg/m ³)	250 ppm	Colorless to brown solid with an odor of mothballs [Note: Shipped as a molten solid.]	MW 128.2 BP 424°F Sol 0.003% F.P 174°F IP 8.12 eV	VP 0.08 mm MLT 176°F UEL 5.9% LEL 0.9%	Strong oxidizers, chromic anhydride	Char; CS; GC/FID; III [#1501; Aromatic Hydro- carbons]
1334 32 (crude or refined) 2304 32 (molten)	1 ppm = 5.33 mg/m ³				Sp Gr 1.15 Combustible Solid, but will take some effort to ignite.			
Naphthalene dithiocyanate $C_{10}H_6(NCS)_2$ 3173-72-6 NQ9600000	1,5-Dithiocyanatonaphthalene; 1,5-Naphthalene dithio- cyanate; 1,5-Naphthalene ester of isocyanic acid; NDI	NIOSH 0.040 mg/m ³ (0.006 ppm) C 0.170 mg/m ³ (0.020 ppm) [10-min] OSHA none	N.D.	White to light- yellow, crystalline flakes.	MW: 210.2 BP: 508°F Sol: ? F.P(oc): 311°F IP: ?	VP(78°F): 0.003 mm MLT: 281°F UEL: ? LEL: ?	None reported	None available
	1 ppm = 8.74 mg/m ³				Sp.Gr: 7 Combustible Solid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin, nose,	Eye	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	500 ppm: SA, CF/PAPROV ¹	Abs	resp sys vs dist cough,	Skin	liver, kidneys
Wash skin:	When contam	1000 ppm: CCRFOV/GMFOV/PAPRTOV ²	ing	in animals: liver, kidney	Breath	
Remove:	When wet (flam)	SCBAF/SAF	Con	damage	Swallow	
Change:	N.R.	1400 ppm: SAF/PD, PP				
Provide:	Eyewash (>15%)	§ SCBAF PD PP/SAF PD PP ASCBA				
	Quick drench (>25%)	Escape: GMFOV/SCBAE				
[Morpholine]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin, nose,	Eye	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	1000 ppm: SA, CF/CCRFOV/GMFOV/	Abs	ir-head, drow, derm	Skin	CNS, liver, kidneys
Wash skin:	When contam	PAPROV/SCBAF/SAF	ing	in animals: liver, kidney	Breath	
Remove:	When wet or contam	§ SCBAF PD PP/SAF PD PP ASCBA	Con	damage	Swallow	
Change:	N.R.	Escape: GMFOV/SCBAE				
[Naphtha (coal tar)]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, head, conf,	Eye	Eyes, skin, blood
Eyes:	Prevent eye contact	100 ppm: CCRFOVDM/SA*	Abs	excitement, mal nau	Skin	liver, kidneys, CNS
Wash skin:	When contam	250 ppm: SA, CF/CCRFOVNE/	ing	vomit, abdom pain, irrit		
Remove:	When wet or contam	PAPROVDM/SCBAF/SAF	Con	bladder, profuse sweat,	Breath	
Change:	Daily	§ SCBAF PD PP/SAF PD PP ASCBA		jaun, noma, hemog renal	Swallow	
		Escape: GMFOVNE/SCBAE		shutdown, derm, optical		
				neuritis, corn damage		
[Naphthalene]						
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, nose, throat;	Eye:	Eyes, resp sys
Eyes:	Prevent eye contact	0.05 ppm: SA*	ing	resp sens, cough, pulm	Skin:	
Wash skin:	When contam	0.125 ppm: SA, CF*	Con	secretions, chest pain,	Breath:	
Remove:	When wet or contam	0.25 ppm: SCBAF/SAF		dysp, asthma	Swallow:	
Change:	Daily	1 ppm: SAF, PD, PP				
		§ SCBAF PD PP/SAF PD PP ASCBA				
		Escape: GMFOV/SCBAE				
[Naphthalene diisocyanate]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P., IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
α-Naphthylamine $C_{10}H_9NH_2$ 134-32-7 QM1400000	1-Aminonaphthalene, 1-Naphthylamine	NIOSH Ca See Appendix A OSHA[1910.1004] See Appendix B	Ca [N.D.]	Colorless crystals with an ammonia- like odor [Note: Darkens in air to a reddish- purple color.]	MW 143.2 BP 573°F Sol 0.002% Fl.P. 315°F IP 7.30 eV	VP(220°F) 1 mm MLT 122°F UEL ? LEL ?	Oxidizes in air	Filter/ Si gel CH ₃ COOH/ 2-Pro- panol, GC/FID, III [#5518]
2077 55					Sp Gr 1.12 Combustible Solid			
β-Naphthylamine $C_{10}H_9NH_2$ 91-59-8 QM2100000	2-Aminonaphthalene, 2-Naphthylamine	NIOSH Ca See Appendix A OSHA[1910.1009] See Appendix B	Ca [N.D.]	Odorless; white to red crystals with a faint, aromatic odor [Note: Darkens in air to a reddish- purple color.]	MW 143.2 BP 563°F Sol Miscible in hot water Fl.P. 315°F IP 9.71 eV	VP(226°F) 1 mm MLT 232°F UEL ? LEL ?	None reported	Filter/ Si gel CH ₃ COOH/ 2-Pro- panol, GC/FID, III [#5518]
1650 55					Sp Gr(208°F) 1.06 Combustible Solid			
Niax® Catalyst ESN 62765-93-8 QR3900000	None [Note: A Mixture of 95% dimethylaminopropio- nitrile & 5% bis(2- dimethylamino)ethyl ether.]	NIOSH/OSHA See Appendix C	N.D.	A liquid mixture. [Note: Used in the past as a catalyst in the manufacture of flexible poly- urethane foams.]	MW: mixture BP: ? Sol: ? Fl.P: ? IP: ?	VP: ? FRZ: ? UEL: ? LEL: ?	Oxidizers	None available
					Sp.Gr: ?			
Nickel carbonyl (as Ni) $Ni(CO)_4$ 13463-39-3 QR6300000	Nickel tetracarbonyl, Tetracarbonylnickel	NIOSH Ca See Appendix A 0.001 ppm (0.007 mg/m ³) OSHA 0.001 ppm (0.007 mg/m ³)	Ca [2 ppm]	Colorless; to yellow liquid with a musty odor [Note: A gas above 110°F.]	MW 170.7 BP 110°F Sol 0.05% Fl.P. <4°F IP 8.28 eV	VP 315 mm FRZ -13°F UEL ? LEL 2%	Nitric acid, bromine, chlorine & other oxidizers; flammable materials	Char[low Ni] HNO ₃ AAS/GF; III [#6007]
1259 57	1 ppm = 7.10 mg/m ³				Sp Gr(63°F) 1.32 Class IB Flammable Liquid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam/Daily When wet or contam Daily Eyewash, Quick drench	NIOSH # SCBAF PD,PP/SAF PD,PP ASCBA Escape: HEF/SCBAE	Inh Abs Ing Con	Derm. hemorrhagic cystitis, dysp, ataxia, methem, hema, dysuria, [canc]	Eye: Skin: Breath: Swallow: Irr. immed Soap wash immed Resp. support Medical attention immed	Bladder, skin [bladder cancer]
[o-Naphthylamine]						
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam/Daily When wet or contam Daily Eyewash, Quick drench	NIOSH # SCBAF PD,PP/SAF PD,PP ASCBA Escape: HEF/SCBAE	Inh Abs Ing Con	Derm. hemorrhagic cystitis, dysp, ataxia, methem, hema, dysuria, [canc]	Eye: Skin: Breath: Swallow: Irr. immed Soap wash immed Resp. support Medical attention immed	Bladder, skin [bladder cancer]
[S-Naphthylamine]						
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam Daily Eyewash, Quick drench	NIOSH # SCBAF PD,PP/SAF PD,PP ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irr. eyes, skin; urinary dysfunc; neurological disorders; pins & needles sensation in hands & feet; muscle weak, less, nau, vomit; decr nerve conduction times of lower legs	Eye: Skin: Breath: Swallow: Irr. immed Soap flush immed Resp support Medical attention immed	Eyes, skin, urinary tract, PNS
[NiAl ₂ O ₃ Catalyst (EN)]						
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet (flame) N.R. Eyewash, Quick drench	NIOSH # SCBAF PD,PP/SAF PD,PP ASCBA Escape: GMFVS/SCBAE	Inh Abs Ing Con	Head, vert; nau, vomit, epigastric pain; subs pain; cough, hyperphic; cyan; weak; leucyt; pneuotis; delirium; convuls; [canc] in animals repro, terato effects	Eye: Skin: Breath: Swallow: Irr. Immed Soap wash immed Resp. support Medical attention immed	Lungs, paranasal sinus, CNS, repro sys [lung & nasal cancer]
[Nickel carbonyl (as Ni)]						

Chemical name, structural formula, CAS and RTECS No., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, Flammability	VP, FRZ UEL, LEL		
Nickel metal and other compounds (as Ni)	Nickel metal; Elemental metal; Nickel catalyst	NIOSH* Ca See Appendix A 0.015 mg/m ³	Ca [10 mg/m ³ (as Ni)]	Metal: Lustrous, silvery, odorless solid.	MW: 58.7 BP: 5139°F Sol: Insoluble FLP: NA IP: NA	VP: 0 mm (approx) MLT: 2831°F UEL: NA LEL: NA	Strong acids, sulfur, selenium, wood & other combustibles, nickel nitrate	Filter; Acid; ICP; III [#7300, Elements]
Ni (Metal)	Synonyms of other nickel compounds vary depending upon the specific compound.	OSHA† 1 mg/m ³			Sp Gr: 8.90 (Metal) Metal: Combustible Solid; nickel sponge catalyst may ignite SPONTANEOUSLY in air.			
7440-02-0 (Metal) Q55950000 (Metal)								
Nicotine	3-(1-Methyl-2-pyrrolidyl)- pyridine	NIOSH/OSHA 0.5 mg/m ³ [skin]	8 mg/m ³	Pale-yellow to dark brown liquid with a fish-like odor when warm [insecticide]	MW: 162.2 BP: 482°F (Decomposes) Sol: Miscible FLP: 203°F IP: 8.01 eV	VP: 0.08 mm FRZ: -110°F UEL: 4.0% LEL: 0.7%	Strong oxidizers, strong acids	XAD-2; Ethyl acetate; GC/Air-FID; II(3); [#S293]
C ₁₀ H ₁₄ N ₂ O 54-11-5 Q55250000					Sp Gr: 1.01 Class IIIB Combustible Liquid			
1654 55	1 ppm = 6.74 mg/m ³							
Nitric acid	Aqua fortis; Engravers acid; Hydrogen nitrate; Red fuming nitric acid (RFNA)	NIOSH/OSHA 2 ppm (5 mg/m ³) ST 4 ppm (10 mg/m ³)	26 ppm	Colorless, yellow, or red, fuming liquid with an acid, sulfocating odor.	MW: 63.0 BP: 181°F Sol: Miscible FLP: NA IP: 11.95 eV	VP: 48 mm FRZ: -44°F UEL: NA LEL: NA	Combustible materials, metallic powders, hydrogen sulfide, carbides, alcohols [Note: Reacts with water to produce heat. Corrosive to metals.]	Sigal; NaHCO ₃ / Na ₂ CO ₃ ; IC; III [#7903, Inorganic Acids]
HNO ₃	White fuming nitric acid (WFNA)	OSHA† 2 ppm (5 mg/m ³)			Sp Gr(77°F): 1.50 Noncombustible Liquid, but increases the flammability of combustible materials			
7697-37-2 Q55775000								
1760 60 (40% acid) 2031 44 (>40% acid) 2032 44 (fuming)	1 ppm = 2.62 mg/m ³	[Note: Often used in an aqueous solution. Fuming nitric acid is concentrated nitric acid that contains dissolved nitrogen dioxide.]						
Nitric oxide	Mononitrogen monoxide, Nitrogen monoxide	NIOSH/OSHA 25 ppm (30 mg/m ³)	100 ppm	Colorless gas [Note: Shipped as anoniquified compressed gas.]	MW: 30.0 BP: -241°F Sol: 5% FLP: NA IP: 9.27 eV	VP: 34.2 atm FRZ: -263°F UEL: NA LEL: NA	Fluorine, combustible materials, ozone, NH ₃ , chlorinated hydro- carbons, metals, carbon disulfide [Note: Reacts with water to form nitric acid. Rapidly converted in air to nitrogen dioxide.]	Mol-sieve*; Reagent; Vis; III [#S321]
NO					RGasD: 1.04 Nonflammable Gas, but will accelerate the burning of combustible materials.			
10102-43-9 QX0525000								
1660 20	1 ppm = 1.25 mg/m ³							

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	Prevent skin contact	NIOSH	Inh	Sens derm, allergic asthma,	Skin:	Nasal cavities,
Eyes:	N.R.	& SCBAF PD PP/SAF PD, PP ASCBA	ing	pneubis; [canc]	Breath:	lungs, skin,
Wash skin:	When contam/Daily	Escape: HIEF/SCBAE	Con		Swallow:	[lung & nasal cancer]
Remove:	When wet or contam					
Change:	Daily					
[Nickel metal and other compounds (as Ni)]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Nau, saliv, abdom pain,	Eye	CNS, CVS, lungs,
Eyes:	Prevent eye contact	5 mg/m ³ SA/SCBAF	Abs	vomit, diarr, head, dizz,	Skin	GIttract, repro sys
Wash skin:	When contam	& SCBAF PD PP/SAF PD, PP ASCBA	ing	hearing, vis dist; conf,	Breath:	
Remove:	When wet or contam	Escape: GMFOV/SCBAE	Con	weak, inco, paroxysmal	Swallow:	
Change:	N.R.			atrial fibril, convuls,		
Provide:	Eyewash, Quick drench			dysp, In animals: terato effects		
[Nicotine]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin, muc memb;	Eye	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	25 ppm: SA, CF/CCRFS/GMFS/	ing	delayed pulm edema,	Skin	teeth
Wash skin:	When contam	SCBAF/SAF	Con	pneubis, bron, dental	Breath:	
Remove:	When wet or contam	& SCBAF PD PP/SAF PD, PP ASCBA		erosion	Swallow:	
Change:	N.R.	Escape: GMFS/SCBAE				
Provide:	Eyewash (pH<2.5), Quick drench (pH<2.5)					
[Nitric acid]						
Skin:	N.R.	NIOSH/OSHA	Inh	Irrit eyes, wet skin, nose,	Breath	Eyes, skin, resp sys,
Eyes:	N.R.	100 ppm: SA, CF/CCRFS/PAPRS*/		throat, drow, uncon; methemo	Resp support	blood, CNS
Wash skin:	N.R.	GMFS/SA/SCBAF				
Remove:	N.R.	& SCBAF PD PP/SAF PD, PP ASCBA				
Change:	N.R.	Escape: GMFS/SCBAE				
[Nitric oxide]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P., IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
p-Nitroaniline $\text{NO}_2\text{C}_6\text{H}_4\text{NH}_2$ 100-01-6 BY7000000	para-Aminonitrobenzene, 4-Nitroaniline, 4-Nitrobenzylamine, p-Nitrophenylamine, PNA	NIOSH 3 mg/m ³ [skin] OSHA† 8 mg/m ³ (1 ppm) [skin]	300 mg/m ³	Bright yellow, crystalline powder with a slight ammonia-like odor	MW 138.1 BP 630°F Sol 0.08% Fl P 390°F IP 6.85 eV	VP: 0.00002 mm MLT 295°F UEL ? LEL ?	Strong oxidizers, strong reducers [Note: May result in spontaneous heating of organic materials in the presence of moisture.]	Filter; 2-Propanol, HPLC/UVD, III [#5033]
1561 55					Sp Gr 1.42 Combustible Solid			
Nitrobenzene $\text{C}_6\text{H}_5\text{NO}_2$ 98-95-3 DA6475000	Essence of mirbane, Nitrobenzol, Oil of mirbane	NIOSH/OSHA 1 ppm (5 mg/m ³) [skin]	200 ppm	Yellow, oily liquid with a pungent odor like paste shoe polish. [Note: A solid below 42°F.]	MW 123.1 BP 411°F Sol 0.2% Fl P 190°F IP 9.92 eV	VP(77°F): 0.3 mm FRZ 42°F UEL ? LEL(200°F): 1.6%	Concentrated nitric acid, nitrogen tetroxide, caustics, phosphorus pentachloride, chemically- active metals such as tin or zinc	Si gel, Methanol, GC/FID, III [#2005]
1662 55	1 ppm = 5.12 mg/m ³				Sp Gr 1.20 Class IIIA Combustible Liquid			
4-Nitrophenyl $\text{C}_6\text{H}_4\text{C}_6\text{H}_4\text{NO}_2$ 92-93-3 DV5600000	p-Nitrophenyl, p-Nitrodiphenyl, 4-Nitrodiphenyl, p-Phenylnitrobenzene, 4-Phenylnitrobenzene, PNB	NIOSH Ca See Appendix A OSHA(1910.1003) See Appendix B	Ca [N.D.]	White to yellow, needle-like, crystalline solid with a sweetish odor.	MW 199.2 BP 644°F Sol Insoluble Fl P 290°F IP ?	VP ? MLT 237°F UEL ? LEL ?	Strong reducers	Filter/ Si gel(2), 2-Propanol, GC/FID, III(4) [P&CAM #273]
					Sp Gr ? Combustible Solid			
p-Nitrochlorobenzene $\text{ClC}_6\text{H}_4\text{NO}_2$ 100-00-5 CZ1050000	p-Chloronitrobenzene, 4-Chloronitrobenzene, 1-Chloro-4-nitrobenzene, 4-Nitrochlorobenzene, PCNB, PNCB	NIOSH Ca See Appendix A OSHA 1 mg/m ³ [skin]	Ca [100 mg/m ³]	Yellow, crystalline solid with a sweet odor.	MW 157.6 BP 468°F Sol: Slight Fl P 261°F IP 9.96 eV	VP(86°F): 0.2 mm MLT 182°F UEL ? LEL ?	Strong oxidizers, alkalis	Si gel, Methanol, GC/FID, III [#2005, Nitro- benzenes]
1578 55					Sp Gr 1.52 Solid that does not burn, or burns with difficulty			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 6)	First aid (See Table 6)	Target organs (See Table 6)
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When wet or contain Remove: When wet or contain Change: Daily Provide: Quick drench		NIOSH 30 mg/m ³ SA* 75 mg/m ³ SA CE* 150 mg/m ³ SCBAF/SAF 300 mg/m ³ SAF PD PP § SCBAF PD PP/SAF PD PP ASCBA Escape: GMFOVDMF/SCBAE	Inh Abs Ing Con	Irrit nose, throat; cyan, ataxia, lacr; lachrym; dysp, irrt; vomit, diarr; convuls; resp arrest; anemia, methemo, jaundice	Eye: Skin: Breath: Swallow: Irrimed Water flush immed Resp support Medical attention immed	Resp sys, blood, heart, liver
[p-Nitroaniline]						
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: N.R. Remove: When wet or contain Change: Daily Provide: Quick drench		NIOSH/OSHA 10 ppm: CCRQV/SA* 25 ppm: SA CE*/PAPROV* 50 ppm: CCRFOV/GMFOV/PAPROV*/ SCBAF/SAF 200 ppm: SAF PD PP § SCBAF PD PP/SAF PD PP ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, skin, anoxia; derm; anemia, methemo; in animals: liver, kidney damage, testicular effects	Eye: Skin: Breath: Swallow: Irrimed Soap wash immed Resp support Medical attention immed	Eyes, skin, blood, liver, kidneys CVS, repro sys
[Nitrobenzene]						
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: W/when contain/Daily Remove: When wet or contain Change: Daily Provide: Eyewash, Quick drench		NIOSH § SCBAF PD PP/SAF PD PP ASCBA Escape: HIEF/SCBAE	Inh Abs Ing Con	Head, leth, dizz; dysp, ataxia, weak; methemo, urinary burning; acute hemorrhagic cystitis; [canc]	Eye: Skin: Breath: Swallow: Irrimed Soap wash immed Resp support Medical attention immed	Bladder, blood [neutropenic; bladder tumors]
[4-Nitrophenyl]						
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contain/Daily Remove: When wet or contain Change: Daily Provide: Eyewash, Quick drench		NIOSH § SCBAF PD PP/SAF PD PP ASCBA Escape: HIEF/SCBAE	Inh Abs Ing Con	Anoxia, unpleasant taste, anemia, methemo; in animals: hemol, hemog; spleen, kidney, bone marrow changes, repro effects; [canc]	Eye: Skin: Breath: Swallow: Irrimed Soap wash immed Resp support Medical attention immed	Blood, liver, kidneys, CVS, spleen, bone marrow, repro sys [in animals: vascular & liver tumors]
[p-Nitrochlorobenzene]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOTID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TLV unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Nitroethane $\text{CH}_3\text{CH}_2\text{NO}_2$ 79-24-3 K15600000	Nitroetan	NIOSH/OSHA 100 ppm (310 mg/m ³)	1000 ppm	Colorless, oily liquid with a mild, fruity odor	MW 75.1 BP 237°F Sol 5% FLP 87°F IP 10.88 eV	VP (77°F): 21 mm FRZ -130°F UEL ? LEL 3.4%	Amines, strong acids, alkalis & oxidizers, hydrocarbons, combustibles, metal oxides	XAD-2(2) Ethyl acetate, GC/FID, III [#2526]
2842 26	1 ppm = 3.12 mg/m ³				Sp Gr 1.05 Class IC Flammable Liquid			
Nitrogen dioxide NO_2 10102-44-0 QW9800000	Dinitrogen tetroxide (N_2O_4), Nitrogen peroxide	NIOSH ST 1 ppm (1.8 mg/m ³) OSHA† C 5 ppm (9 mg/m ³)	20 ppm	Yellowish-brown liquid or reddish- brown gas (above 70°F) with a pun- gent, acid odor (Note: In solid form (below 15°F) it is found structurally as N_2O_4 .)	MW 46.0 BP 70°F Sol: Reacts FLP NA IP 9.75 eV	VP 720 mm FRZ 15°F UEL NA LEL NA	Combustible material; water chlorinated hydrocarbons, carbon disulfide, ammonia [Note: Reacts with water to form nitric acid.]	Palmer Tube Reagent, Vis. III [#6700]
1067 20	1 ppm = 1.91 mg/m ³				Sp Gr 1.44 (Liquid at 68°F) RGasD: 2.62 Noncombustible Liquid/Gas, but will accelerate the burning of combustible materials			
Nitrogen trifluoride NF_3 7783-54-2 QX1925000	Nitrogen fluoride, Trifluoramine, Trifluorammonia	NIOSH/OSHA 10 ppm (29 mg/m ³)	1000 ppm	Colorless gas with a moldy odor [Note: Shipped as a nonliquefied compressed gas.]	MW 71.0 BP -200°F Sol: Slight FLP NA IP 12.97 eV	VP >1 atm FRZ -340°F UEL NA LEL NA	Water, oil, grease, oxidizable materials, ammonia, carbon monoxide, methane, hydrogen, hydrogen sulfide, activated charcoal, diborane	None available
2451 15	1 ppm = 2.95 mg/m ³				RGasD: 2.46 Nonflammable Gas			
Nitroglycerine $\text{CH}_3\text{NO}_2\text{CHNO}_2\text{CH}_2\text{NO}_2$ 55-63-0 Q12100000 1204 26 (1% soln. in alcohol) 3064 26 (1-5% soln. in alcohol)	Glyceryl trinitrate, NG, 1,2,3-Propanetriol trinitrate Trinitroglycerine	NIOSH ST 0.1 mg/m ³ [skin] OSHA† C 0.2 ppm (2 mg/m ³) [skin]	75 mg/m ³	Colorless to pale- yellow, viscous liquid or solid (below 56°F) [Note: An explosive ingredient in dynamite (20-40%) with ethylene glycol dinitrate (80-60%).]	MW 227.1 BP: Begins to decompose at 122-140°F Sol 0.1% FLP Explodes IP ?	VP 0.0003 mm FRZ 56°F UEL ? LEL ?	Heat, ozone, shock, acids [Note: An OSHA Class A Explosive (1910.109)]	Tenax GC, Ethanol, GC/ECD, III [#2507]
	1 ppm = 9.44 mg/m ³				Sp Gr 1.60 Explosive Liquid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 6)
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet (flam)	NIOSH/OSHA 100 ppm SCBAF/SAF § SCBAF PD PP/SAF PD PP ASCBA Escape SCBAE	Inh Ing Con	Der in animals lac dysp palm rales, edema liver, kidney inj, narco	Eye Skin Breath Swallow Immed Soap wash prompt Resp support Medical attention immed	Skin resp sys, CNS, kidneys, liver
[Nitroethane]						
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R. Eyewash, Quick drench	NIOSH 20 ppm SA CF/SCBAF/SAF § SCBAF PD PP/SAF PD PP ASCBA Escape GMFS/SCBAE	Inh Ing Con	Irr eyes, nose, throat; cough, mucoid frothy sputum decr pulm func, chronic bron, dysp chest pain, pulm edema, cyan, tachypnea, tacer	Eye Skin Breath Swallow Immed Water flush immed Resp support Medical attention immed	Eyes, resp sys, CVS
[Nitrogen dioxide]						
Skin: Eyes: Wash skin: Remove: Change:	N.R. N.R. N.R. N.R. N.R.	NIOSH/OSHA 100 ppm CCRS/SA 250 ppm SA CF/PAPRS 500 ppm CCRFS/GMFS/PAPRTS*/ SAT CF/SCBAF/SAF 1000 ppm SAF PD PP § SCBAF PD PP/SAF PD PP ASCBA Escape GMFS/SCBAE	Inh	In animals anoxia, cyan, methemo weak dizz, head, liver, kidney inj	Breath Resp support	Blood, liver, kidneys
[Nitrogen trifluoride]						
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet (flam) Daily Quick drench	NIOSH 1 mg/m ³ SA* 2.5 mg/m ³ SA CF* 5 mg/m ³ SAT CF/SCBAF/SAF 75 mg/m ³ SAF PD PP § SCBAF PD PP/SAF PD PP ASCBA Escape GMF OVH/SCBAE	Inh Abs Ing Con	Throb head, dizz, nau, vom, abdom pain, hypotension, flush, pale methemo delirium, CNS depres, angina, skin irrit	Eye Skin Breath Swallow Immed Soap wash immed Resp support Medical attention immed	CVS, blood, skin, CNS
[Nitroglycerine]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL F.P., IP, Sp. Gr, flammability	VP, FRZ UEL, LEL		
Nitromethane <chem>CH3NO2</chem> 75-52-5 PA9800000	Nitrocarbol	NIOSH See Appendix D OSHA 100 ppm (250 mg/m ³)	750 ppm	Colorless, oily liquid with a disagreeable odor	MW: 61.0 BP: 214°F Sol: 10% F.P.: 95°F IP: 11.08 eV	VP: 28 mm FRZ: -20°F UEL: ? LEL: 7.3%	Amines, strong acids, alkalis & oxidizers, hydrocarbons & other combustible materials, metallic oxides [Note: Slowly corrodes steel & copper when wet.]	Chrom-106, Ethyl acetate, GC/FID, II [#2527]
1261 26	1 ppm = 2.54 mg/m ³				Sp. Gr: 1.14 Class IC Flammable Liquid			
2-Nitronaphthalene <chem>C10H7NO2</chem> 581-89-5 QJ9760000	8-Nitronaphthalene	NIOSH Ca* See Appendix A [Note: Since metabolized to 8-Naphthylamine.] OSHA none	Ca [N.D.]	Colorless solid.	MW: 178.2 BP: ? Sol: Insoluble F.P.: ? IP: 8.67 eV	VP: ? MLT: 174°F UEL: ? LEL: ?	For "Nitrates" in general: Aluminum, cyanides, esters, phosphorus, tin chloride, thiocyanates, sodium hypophosphite	None available
1-Nitropropane <chem>CH3CH2CH2NO2</chem> 108-03-2 TZ5075000	Nitropropane, 1-NP	NIOSH/OSHA 25 ppm (90 mg/m ³)	1000 ppm	Colorless liquid with a somewhat disagreeable odor	MW: 89.1 BP: 269°F Sol: 1% F.P.: 96°F IP: 10.81 eV	VP: 8 mm FRZ: -162°F UEL: ? LEL: 2.2%	Amines, strong acids, alkalis & oxidizers, hydrocarbons & other combustible materials, metal oxides	XAD-4, CS, GC/NPD, OSHA [#46]
2608 26	1 ppm = 3.70 mg/m ³				Sp. Gr: 1.00 Class IC Flammable Liquid			
2-Nitropropane <chem>(CH3)2CHNO2</chem> 79-46-9 TZ5250000	Dimethylnitromethane, iso-Nitropropane, 2-NP	NIOSH Ca See Appendix A OSHA† 25 ppm (90 mg/m ³)	Ca [100 ppm]	Colorless liquid with a pleasant, fruity odor	MW: 89.1 BP: 249°F Sol: 2% F.P.: 75°F IP: 10.71 eV	VP: 13 mm FRZ: -135°F UEL: 11.0% LEL: 2.6%	Amines, strong acids, alkalis & oxidizers, metal oxides, combustible materials	Chrom-106, Ethyl acetate, GC/FID, II [#2528]
none	1 ppm = 3.70 mg/m ³				Sp. Gr: 0.99 Class IC Flammable Liquid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)		Target organs (See Table 5)
Skin:	Prevent skin contact	OSHA	Inh	Derm.	Eye	Innmed	Eyes, skin, CNS,
Eyes:	Prevent eye contact	750 ppm: SA; CF/SCBAF/SAF	Ing	In animals: Irrit eyes, resp	Skin	Soap wash prompt	liver
Wash skin:	When contam	g SCBAF PD PP/SAF PD PP ASCBA	Con	sys; convuls, narcosis; liver damage	Breath	Resp support	
Remove:	When wet (flam)	Escape: SCBAE			Swallow	Medical attention	
Change:	N.R.					Immed	
[Nitromethane]							
Skin:	Prevent skin contact	NIOSH	Inh	Irrit skin, resp sys;	Eye:	Innmed	Skin, resp sys
Eyes:	Prevent eye contact	g SCBAF PD PP/SAF PD PP ASCBA	Abs	derm; [canc]	Skin:	Soap wash Immed	[bladder cancer]
Wash skin:	When contam/Daily	Escape: GMFOVHIE/SCBAE	Ing		Breath:	Resp support	
Remove:	When wet or contam		Con		Swallow:	Medical attention	
Change:	Daily					Immed	
Provide:	Eyewash, Quick drench						
[2-Nitronaphthalene]							
Skin:	N.R.	NIOSH/OSHA	Inh	Irrit eyes, head, nau,	Eye	Innmed	Eyes, CNS,
Eyes:	Prevent eye contact	250 ppm: SA*	Ing	vomit, diarr.	Skin	Soap wash prompt	liver, kidneys
Wash skin:	N.R.	625 ppm: SA CF*	Con	In animals: liver, kidney damage	Breath	Resp support	
Remove:	When wet (flam)	1000 ppm: SCBAF/SAF			Swallow:	Medical attention	
Change:	N.R.	g SCBAF PD PP/SAF PD PP ASCBA				Immed	
		Escape: SCBAE					
[1-Nitropropane]							
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, skin, nose,	Eye	Innmed	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	g SCBAF PD PP/SAF PD PP ASCBA	Ing	resp sys head, anx, nau,	Skin	Soap wash prompt	CNS kidneys, liver
Wash skin:	When contam	Escape: SCBAE	Con	vomit, diarr; kidney, liver damage; [canc]	Breath	Resp support	[In animals:
Remove:	When wet (flam)				Swallow:	Medical attention	liver tumors]
Change:	N.R.					Immed	

[2-Nitropropane]

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL F.P., IP, Sp. Gr., flammability	VP, FRZ UEL, LEL		
N-Nitrosodimethylamine $(\text{CH}_3)_2\text{N}_2\text{O}$ 62-75-9 1Q0525000	Dimethylnitrosamine, N,N-Dimethylnitrosamine, DMNA, N-Methyl-N-nitroso- methanamine, NDMA, N-Nitroso-N,N-dimethylamine	NIOSH Ca See Appendix A OSHA(1910.1016) See Appendix B	Ca [N.D.]	Yellow, oily liquid with a faint, character- istic odor	MW 74.1 BP 306°F Sol. Soluble F.P. ? IP 8.69 eV	VP 3 mm FRZ ? UEL ? LEL ?	Strong oxidizers [Note: Should be stored in dark bottles.]	T-Sorb, Methanol/ CH_2Cl_2 , GC/FID, III [#2522]
	1 ppm = 3.08 mg/m ³				Sp Gr. 1.005 Combustible Liquid			
o-Nitrotoluene $\text{NO}_2\text{C}_6\text{H}_4\text{CH}_3$ 88-72-2 XT3150000	o-Methylnitrobenzene, 2-Methylnitrobenzene, ortho-Nitrotoluene, 2-Nitrotoluene	NIOSH 2 ppm (11 mg/m ³) [skin] OSHA† 5 ppm (30 mg/m ³) [skin]	200 ppm	Yellow liquid with a weak, aromatic odor. [Note: A solid below 25°F.]	MW 137.1 BP 432°F Sol. 0.07% F.P. 223°F IP 9.43 eV	VP 0.1 mm FRZ 25°F UEL ? LEL 2.2%	Strong oxidizers, sulfuric acid	Sig el, Methanol, GC/FID, III [#2005, Nitro- benzenes]
	1 ppm = 5.70 mg/m ³				Sp Gr. 1.16 Class IIIB Combustible Liquid			
m-Nitrotoluene $\text{NO}_2\text{C}_6\text{H}_4\text{CH}_3$ 99-08-1 XT2975000	m-Methylnitrobenzene, 3-Methylnitrobenzene, meta-Nitrotoluene, 3-Nitrotoluene	NIOSH 2 ppm (11 mg/m ³) [skin] OSHA† 5 ppm (30 mg/m ³) [skin]	200 ppm	Yellow liquid with a weak, aromatic odor. [Note: A solid below 59°F.]	MW 137.1 BP 450°F Sol. 0.05% F.P. 223°F IP 9.48 eV	VP 0.1 mm FRZ 59°F UEL ? LEL 1.6%	Strong oxidizers, sulfuric acid	Sig el, Methanol, GC/FID, III [#2005, Nitro- benzenes]
	1 ppm = 5.70 mg/m ³				Sp Gr. 1.16 Class IIIB Combustible Liquid			
p-Nitrotoluene $\text{NO}_2\text{C}_6\text{H}_4\text{CH}_3$ 99-99-0 XT3325000	p-Methylnitrobenzene, 4-Methylnitrobenzene, para-Nitrotoluene, 4-Nitrotoluene	NIOSH 2 ppm (11 mg/m ³) [skin] OSHA† 5 ppm (30 mg/m ³) [skin]	200 ppm	Crystalline solid with a weak aromatic odor	MW 137.1 BP 460°F Sol. 0.04% F.P. 223°F IP 9.50 eV	VP 0.1 mm MLT 126°F UEL ? LEL 1.8%	Strong oxidizers, sulfuric acid	Sig el, Methanol, GC/FID, III [#2005, Nitro- benzenes]
	1 ppm = 5.70 mg/m ³				Sp Gr. 1.12 Combustible Solid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 6)	First aid (See Table 8)	Target organs (See Table 6)
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam/Daily When wet or contam Daily Eyewash, Quick drench	NIOSH § SCBAF PD PP/SAF PD/PP ASCBA Escape HIEF/SCBAE	Inh Abs Ing Con	Nau, vomit, diarr, abdom cramps, head, fever, enlarged liver, jaun, decr liver, kidney, pulm func; [canc]	Eye: Skin Breath: Swallow Immmed Soap wash immmed Resp support Medical attention immmed	Liver, kidneys, lungs [in animals: lung, kidney, liver & nasal cavity tumors]
[N-Nitrosodimethylamine]						
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R.	NIOSH 20 ppm SA* 50 ppm SA CF* 100 ppm SAT CF*/SCBAF/SAF 200 ppm SAF PD/PP § SCBAF PD PP/SAF PD/PP ASCBA Escape GMFOVH/E/SCBAE	Inh Abs Ing Con	Anoxia, cyan, head, weak, dizz, ataxia, dysp, tacar, nau, vomit	Eye: Skin Breath: Swallow Immmed Soap wash immmed Resp support Medical attention immmed	Blood, CNS, CVS, skin, GI tract
[o-Nitrotoluene]						
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R.	NIOSH 20 ppm SA* 50 ppm SA CF* 100 ppm SAT CF*/SCBAF/SAF 200 ppm SAF PD/PP § SCBAF PD PP/SAF PD/PP ASCBA Escape GMFOVH/E/SCBAE	Inh Abs Ing Con	Anoxia, cyan, head, weak, dizz, ataxia, dysp, tacar, nau, vomit	Eye: Skin Breath: Swallow Immmed Soap wash immmed Resp support Medical attention immmed	Blood, CNS, CVS, skin, GI tract
[m-Nitrotoluene]						
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet or contam Daily	NIOSH 20 ppm SA* 50 ppm SA CF* 100 ppm SAT CF*/SCBAF/SAF 200 ppm SAF PD/PP § SCBAF PD PP/SAF PD/PP ASCBA Escape GMFOVH/E/SCBAE	Inh Abs Ing Con	Anoxia, cyan, head, weak, dizz, ataxia, dysp, tacar, nau, vomit	Eye: Skin Breath: Swallow Immmed Soap wash immmed Resp support Medical attention immmed	Blood, CNS, CVS, skin, GI tract
[p-Nitrotoluene]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL F.L.P., IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Nitrous oxide N_2O 10024-97-2 QX1350000 1070 14 (compressed) 2201 23 (cryogenic liquid)	Dinitrogen monoxide, Hyponitrous acid anhydride, Laughing gas 1 ppm = 1.83 mg/m ³	NIOSH* 25 ppm (46 mg/m ³) (TWA over the time exposed) [Note: REL for exposure to waste anesthetic gas.] OSHA none	N.D.	Colorless gas with a slightly sweet odor. [Inhalation anesthetic] [Note: Shipped as a liquefied compressed gas.]	MW: 44.0 BP: -127°F Sol: (77°F): 0.1% F.L.P.: NA IP: 12.89 eV RQASD: 1.53 Nonflammable Gas, but supports combustion at elevated temperatures.	VP: 51.3 atm FRZ: -132°F UEL: NA LEL: NA	Aluminum, boron, hydrazine, lithium hydride, phosphine, sodium	Bag: none; IR: M [#6600]
Nonane $CH_3(CH_2)_7CH_3$ 111-84-2 RA6115000 1920 27	n-Nonane, Nonyl hydride 1 ppm = 5.33 mg/m ³	NIOSH 200 ppm (1050 mg/m ³) OSHA† none	N.D.	Colorless liquid with a gasoline- like odor.	MW: 128.3 BP: 303°F Sol: Insoluble F.L.P.: 88°F IP: 10.21 eV Sp.Gr: 0.72 Class IC Flammable Liquid	VP: 3 mm FRZ: -60°F UEL: 2.9% LEL: 0.8%	Strong oxidizers (e.g., peroxides, nitrates, perchlorates)	None available
1-Nonanethiol $CH_3(CH_2)_7SH$ 1455-21-6	1-Mercaptanonane, n-Nonyl mercaptan, Nonylthiol 1 ppm = 6.66 mg/m ³	NIOSH C 0.5 ppm (3.3 mg/m ³) (15-min) OSHA none	N.D.	Liquid.	MW: 160.3 BP: ? Sol: Insoluble F.L.P.: ? IP: ? Sp.Gr: ? Combustible Liquid	VP: ? FRZ: ? UEL: ? LEL: ?	Oxidizers, reducing agents, strong acids & bases, alkali metals	None available
Octachloronaphthalene $C_{10}Cl_8$ 2734-13-1 QK0250000	Halowax® 1051, 1,2,3,4,5,6,7,8-Octa- chloronaphthalene, Perchloronaphthalene	NIOSH 0.1 mg/m ³ ST 0.3 mg/m ³ [skin] OSHA† 0.1 mg/m ³ [skin]	Unknown	Waxy, pale-yellow solid with an aromatic odor	MW: 403.7 BP: 770°F Sol: Insoluble F.L.P.: NA IP: ? Sp.Gr: 2.00 Noncombustible Solid	VP: <1 mm MLT: 365°F UEL: NA LEL: NA	Strong oxidizers	Filter Hexane GC/FID, H(2) [#S97]

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)	
Skin: Eyes: Wash skin: Remove: Change: Provide:	Frostbite Frostbite N.R. N.R. N.R. Frostbite	TBAL	Inh Con (lg)	Dysp; drow, head; asphy; repro effects; lg: frostbite	Eye: Skin: Breath:	Frostbite Frostbite Fresh air	Resp sys, CNS, repro sys
[Nitrous oxide]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	N.R. Prevent eye contact Daily When wet (flam) N.R. Eyewash	TBAL	Inh Ing Con	Irrit eyes, skin, nose, throat; head, drow, dizz, conf, nau, tremor, inco; dysp; chemical pneu (aspir lg)	Eye: Skin: Breath: Swallow:	Irr Irrmed Soap wash Irrmed Resp support Medical attention Irrmed	Eyes, skin, resp sys, CNS
[None]							
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R.	NIOSH 5 ppm: CCROV/SA 12.5 ppm: SA:CF/PAPROV 25 ppm: CCRFOV/GMFOV/PAPRTOV/ SCBAF/SAF 5: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, skin, nose, throat; weak, cyan, inor respiration, nau, drow, head, vomit	Eye: Skin: Breath: Swallow:	Irr Irrmed Soap wash Resp support Medical attention Irrmed	Eyes, skin, resp sys, blood, CNS
[1-Nonanethiol]							
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam/Daily When wet or contam Daily	NIOSH/OSHA 1 mg/m ³ SA/SCBAF 5: SCBAF PD PP/SAF PD PP ASCBA Escape: GMFOVH/SCBAE	Inh Abs Ing Con	Acne-form derm, liver damage, jaun	Eye Skin Breath Swallow:	Irr Irrmed Water flush Irrmed Resp support Medical attention Irrmed	Skin, liver

235

Chemical name, structural formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
1-Octadecanethiol $\text{CH}_3(\text{CH}_2)_{16}\text{SH}$ 2885-00-9	1-Mercaptooctadecane, Octadecyl mercaptan, Stearyl mercaptan	NIOSH C 0.5 ppm (5.9 mg/m ³) [15-min] OSHA none	N.D.	Solid or liquid (above 77°F).	MW: 286.6 BP: ? Sol: Insoluble Fl.P: ? IP: ? Sp. Gr: 0.85 Combustible Solid Combustible Liquid	VP: ? MLT: 77°F UEL: ? LEL: ?	Oxidizers, reducing agents, strong acids & bases, alkali metals	None available
Octane $\text{CH}_3(\text{CH}_2)_6\text{CH}_3$ 111-65-9 RG8400000	n-Octane, normal-Octane	NIOSH 75 ppm (350 mg/m ³) C 385 ppm (1800 mg/m ³) [15-min] OSHA† 500 ppm (2350 mg/m ³)	1000 ppm [LEL]	Colorless liquid with a gasoline- like odor	MW 114.2 BP 258°F Sol: 77°F; 0.00007% Fl.P 56°F IP 9.82 eV	VP 10 mm FRZ -70°F UEL 6.5% LEL 1.0%	Strong oxidizers	Char. CS, GC/FID, IR [#1500, Hydro- carbons]
1262-27	1 ppm = 4.75 mg/m ³				Sp. Gr: 0.70 Class IB Flammable Liquid			
1-Octanethiol $\text{CH}_3(\text{CH}_2)_7\text{SH}$ 111-58-8	1-Mercaptooctane, n-Octyl mercaptan, Octylthiol, 1-Octylthiol	NIOSH C 0.5 ppm (3.0 mg/m ³) [15-min] OSHA none	N.D.	Water-white liquid with a mild odor.	MW: 146.3 BP: 390°F Sol: Insoluble Fl.P(oc): 115°F IP: ? Sp. Gr: 0.84 Class II Combustible Liquid	VP(212°F): 3 mm FRZ: -57°F UEL: ? LEL: ?	Oxidizers, reducing agents, strong acids & bases, alkali metals	Tenax GC; Acetone; GC/FPD; IR [#2510]
Oil mist (mineral) B012-96-1 PY8030000	Heavy mineral oil mist, Paraffin oil mist, White mineral oil mist	NIOSH 5 mg/m ³ ST 10 mg/m ³ OSHA 5 mg/m ³	2500 mg/m ³	Colorless oily liquid aerosol dispersed in air [Note: Has an odor like burned lubricating oil.]	MW Varies BP 680°F Sol: Insoluble Fl.P(oc): 380°F IP: ? Sp. Gr: 0.90 Class IIIB Combustible Liquid	VP <0.5 mm 3 mm UEL ? LEL ?	None reported	Filter CFC-113, IR [#5026]

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet or contam Daily	NIOSH 5 ppm: CCROV/SA 12.5 ppm: SA CF/PAPROV 25 ppm: CCRFOV/GMFOV/PAPRTOV/ SCBAF/SAF § SCBAF PD, PP/SAF PD, PP/ASCBA Escape: GMFOV/SCBAE	Inh Abs Inh Con	Irrit eyes, skin, resp sys; head, dizz, weak, cyan, naus, convuls	Eye: Skin: Breath: Swallow: Immersed Soap wash Immersed Resp support Medical attention Immersed	Eyes, skin, resp sys, CNS, blood
[1-Octadecanethiol]						
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet (flamm) N.R.	NIOSH 750 ppm: SA* 1000 ppm: SA CF/SCBAF/SAF § SCBAF PD, PP/SAF PD, PP/ASCBA Escape: GMFOV/SCBAE	Inh Inh Con	Irrit eyes, nose, drow; derm: chemical pneum (aspir liq); in animals: narco	Eye: Skin: Breath: Swallow: Immersed Soap wash prompt Resp support Medical attention Immersed	Eyes, skin, resp sys, CNS
[Octane]						
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R.	NIOSH 5 ppm: CCROV/SA 12.5 ppm: SA CF/PAPROV 25 ppm: CCRFOV/GMFOV/PAPRTOV/ SCBAF/SAF § SCBAF PD, PP/SAF PD, PP/ASCBA Escape: GMFOV/SCBAE	Inh Inh Con	Irrit eyes, skin, nose, throat, weak, cyan, incr respiration, nau, drow, head, vomit	Eye: Skin: Breath: Swallow: Immersed Soap wash Immersed Resp support Medical attention Immersed	Eyes, skin, resp sys, blood, CNS
[1-Octanethiol]						
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact N.R. When contam When wet or contam Daily	NIOSH/SHA 50 mg/m ³ : H ₂ S/SA 125 mg/m ³ : SA CF/PAPR/H ₂ E 250 mg/m ³ : H ₂ S/SAT CF/PAPR/H ₂ E/ SCBAF/SAF 2500 mg/m ³ : SA PD, PP § SCBAF PD, PP/SAF PD, PP/ASCBA Escape: H ₂ E/SCBAE	Inh Con	Irrit eyes, skin, resp sys	Skin: Breath: Soap wash Fresh air	Eyes, skin, resp sys
[Oil mist (mineral)]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl, P, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Osmium tetroxide (as Os) OsO ₄ 20816-12-0 RN1140000	Osmic acid anhydride, Osmium oxide	NIOSH 0.002 mg/m ³ (0.0002 ppm) ST 0.006 mg/m ³ (0.0006 ppm) OSHA† 0.002 mg/m ³	1 mg/m ³ (as Os)	Colorless, crystalline solid or pale-yellow mass with an unpleasant, acid, chlorine-like odor [Note: A liquid above 105°F]	MW 254.2 BP 266°F Sol(77°F) 6% FIP NA IP 12.60 eV Sp Gr 5.10 Noncombustible Solid	VP 7 mm MLT 105°F UEL NA UEL NA	Hydrochloric acid, easily oxidized organic materials [Note: Begins to sublime below BP. Contact with other materials may cause fire.]	None available
2471 55	1 ppm = 10.57 mg/m ³							
Oxalic acid HOOC-COOH-2H ₂ O 144-62-7 R02450000	Ethanedioic acid Oxalic acid (aqueous), Oxalic acid dihydrate	NIOSH 1 mg/m ³ ST 2 mg/m ³ OSHA† 1 mg/m ³	500 mg/m ³	Colorless odorless powder or granular solid [Note: The anhydrous form (COOH) ₂ is an odorless, white solid.]	MW 126.1 BP Sublimes Sol 14% FIP ? IP ? Sp Gr 1.90 Combustible Solid	VP <0.001 mm MLT 215°F (Sublimes) UEL ? LEL ?	Strong oxidizers, silver compounds, strong alkalis, chlorates [Note: Gives off water of crystallization at 215°F and begins to sublime.]	None available
Oxygen difluoride OF ₂ 7783-41-7 R52100000	Difluorine monoxide, Fluorine monoxide, Oxygen fluoride	NIOSH 0.05 ppm (0.1 mg/m ³) OSHA† 0.05 ppm (0.1 mg/m ³)	0.5 ppm	Colorless gas with a peculiar, foul odor [Note: Shipped as a nonliquefied compressed gas.]	MW 54.0 BP -230°F Sol 0.02% FIP NA IP 13.11 eV RGasD: 1.85 Nonflammable Gas, but a strong oxidizer	VP >1 atm FRZ -371°F UEL NA LEL NA	Combustible materials: chlorine, bromine, iodine, platinum metal oxides, moist air, hydrogen sulfide, hydrocarbons, water [Note: Reacts very slowly with water to form hydrofluoric acid.]	None available
2190 20	1 ppm = 2.24 mg/m ³							
Ozone O ₃ 10028-15-6 R58225000	Triatomic oxygen	NIOSH 0.1 ppm (0.2 mg/m ³) OSHA† 0.1 ppm (0.2 mg/m ³)	5 ppm	Colorless to blue gas with a very pungent odor	MW 48.0 BP -169°F Sol(32°F) 0.001% FIP NA IP 12.52 eV RGasD: 1.66 Nonflammable Gas, but a powerful oxidizer	VP >1 atm FRZ -315°F UEL NA LEL NA	All oxidizable materials (both organic & inorganic)	Imp. Reagent, V.S. [1] [P&CAM #154]

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	Prevent skin contact	NIOSH/OSHA	Inh Ing Con	Irrit eyes, resp sys, lac, vis dist, cors, head, cough, dysp, derm	Eye Skin Breath Swallow	Eyes, skin, resp sys
Eyes:	Prevent eye contact	0.1 mg/m ³ CCRFS/HE/GMFS/HE/ SCBAF/SAF				
Wash skin:	When contam	1 mg/m ³ SAF PD, PP				
Remove:	When wet or contam	§ SCBAF PD, PP/SAF PD, PP ASCBA				
Change:	Daily	Escape GMFS/HE/SCBAE				
Provide:	Eyewash					
[Osmium tetroxide (as Os)]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh Ing Con	Irrit eyes, skin, muc memb, eye burns, local pain, cyan, shock, collapse, convuls, kidney damage	Eye Skin Breath Swallow	Eyes, skin, resp sys, kidneys
Eyes:	Prevent eye contact	25 mg/m ³ SA CF/PAPRDM				
Wash skin:	When contam	50 mg/m ³ HEF/SCBAF/SAF				
Remove:	When wet or contam	500 mg/m ³ SAF PD, PP				
Change:	Daily	§ SCBAF PD, PP/SAF PD, PP ASCBA				
Provide:	Eyewash	Escape HEF/SCBAE				
[Oxalic acid]						
Skin:	N.R.	NIOSH/OSHA	Inh Con	Irrit eyes, skin, resp sys, head, pulm edema, eye, skin burns (from contact with the gas under pressure)	Eye Skin Breath	Eyes, skin, resp sys
Eyes:	N.R.	0.5 ppm SA/SCBAF				
Wash skin:	N.R.	§ SCBAF PD, PP/SAF PD, PP ASCBA				
Remove:	N.R.	Escape GMFS/SCBAE				
Change:	N.R.					
[Oxygen difluoride]						
Skin:	N.R.	NIOSH/OSHA	Inh Con	Irrit eyes, muc memb, pulm edema, chronic resp disease	Eye Breath	Eyes, resp sys
Eyes:	N.R.	1 ppm CCRS/SA				
Wash skin:	N.R.	2.5 ppm SA CF/PAPRS				
Remove:	N.R.	5 ppm CCRFS/HE/GMFS/SAF CF/ SCBAF/SAF				
Change:	N.R.	§ SCBAF PD, PP/SAF PD, PP ASCBA				
		Escape GMFS/SCBAE				
[Ozone]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Paraffin wax fume $C_{25}H_{52}$ 8002-74-2 RV0350000	Paraffin fume, Paraffin scale fume	NIOSH 2 mg/m ³ OSHA† none	N.D.	Paraffin wax is a white to slightly yellowish, odorless solid. [Note: Consists of a mixture of high molecular weight hydrocarbons (e.g., $C_{25}H_{52}$)]	MW: 350-420 BP: ? Sol: Insoluble FLP: 390°F IP: ? Sp.Gr: 0.88-0.92 Combustible Solid	VP: ? MLT: 115-154°F UEL: ? LEL: ?	None reported	None available
Paraquat (Paraquat dichloride) $CH_3(C_6H_4N)_3CH_3 \cdot 2Cl$ 1910-42-5 DW2275000	1,1'-Dimethyl-4,4'-bipyridinium dichloride; N,N'-Dimethyl-4,4'-bipyridinium dichloride; Paraquat chloride; Paraquat dichloride [Note: Paraquat is a cation ($C_{12}H_{14}N_2^+$); the commercial product is the dichloride salt of paraquat.]	NIOSH 0.1 mg/m ³ (resp) [skin] OSHA† 0.5 mg/m ³ (resp) [skin]	1 mg/m ³	Yellow solid with a faint, ammonia-like odor [herbicide]	MW 257.2 BP Decomposes Sol. Miscible FLP NA IP ? Sp.Gr 1.24 Noncombustible Solid	VP <0.0000001 mm MLT 572°F (Decomposes) UEL NA LEL NA	Strong oxidizers, alkylaryl-sulfonate wetting agents [Note: Corrosive to metals. Decomposes in presence of ultraviolet light.]	Filter; Water; HPLC/UV/D; II [#5003]
Parathion $(C_8H_{10}O_5P(S)OC_6H_4NO_2)$ 56-38-2 TF4550000 2783 55 (liquid/dry) 2784 28 (flammable liquid)	O,O-Diethyl-O(p-nitrophenyl) phosphorothioate; Diethyl parathion; Ethyl parathion; Parathion-ethyl 1 ppm = 12.11 mg/m ³	NIOSH 0.05 mg/m ³ [skin] OSHA 0.1 mg/m ³ [skin]	10 mg/m ³	Pale-yellow to dark-brown liquid with a garlicky odor [Note: A solid below 43°F. Pesticide that may be absorbed on a dry carrier.]	MW 291.3 BP 707°F Sol: 0.001% FLP(oc): 392°F IP: ? Sp.Gr 1.27 Class III Combustible Liquid	VP: 0.00004 mm FRZ 43°F UEL: ? LEL: ?	Strong oxidizers, alkaline materials	Filter; Isocetane; GC/FPD; II [#5012]
Particulates not otherwise regulated	"Inert" dusts, Nuisance dusts, PM ₁₀ R [Note: Includes all inert or nuisance dusts, whether mineral, inorganic, or organic, not listed specifically in 1910.1000.]	NIOSH See Appendix D OSHA 15 mg/m ³ (total) 5 mg/m ³ (resp)	N.D.	Dusts from solid substances without specific occupational exposure standards.	Properties vary depending upon the specific solid.		Varies	Filter; none; Grav; II [Nuisance Dust: #0500 (total), #1400 (resp)]

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Route	Symptoms (See Table 5)	Health hazards		Target organs (See Table 5)
					First aid (See Table 8)		
Skin:	N.R.	TBAL	Inh	Irritates eyes, skin, resp sys;	Eye:	Immediate	Eyes, skin, resp sys
Eyes:	Prevent eye contact		Con	discomfort, nau	Breath:	Resp support	
Wash skin:	N.R.						
Remove:	N.R.						
Change:	N.R.						
[Paraffin wax fume]							
Skin:	Prevent skin contact	NIOSH	Inh	Irritates eyes, skin, nose,	Eye	Immediate	Eyes, skin, resp sys
Eyes:	Prevent eye contact	1 mg/m ³ : CCROVDMFu*/PAPROVDMFu/	Abs	throat, resp sys; epis	Skin	Water flush immedi	heart, liver,
Wash skin:	When contam	SA*/SCBAF	Ing	derm, lingual damage,	Breath	Resp support	kidneys, GI tract
Remove:	When wet or contam	§ SCBAF PD PP/SAF PD PP ASCBA	Con	md GI tract, heart	Swallow	Medical attention	
Change:	N.R.	Escape: GMFOVHE/SCBAE		Liver, kidney damage		imed	
Provide:	Quick drench						
[Paraquat]							
Skin:	Prevent skin contact	NIOSH	Inh	Irritates eyes, skin, resp sys,	Eye	Immediate	Eyes, skin, resp sys
Eyes:	Prevent eye contact	0.5 mg/m ³ : CCROVDMFu/SA	Abs	miosis, run head, chest	Skin	Soap wash immedi	CNS, CVS, blood chol
Wash skin:	When contam	1.25 mg/m ³ : SA CF/PAPROVDMFu	Ing	tight, wheez, lar spasm,	Breath	Resp support	
Remove:	When wet or contam	2.5 mg/m ³ : CCRT OVHE/SAT CF/	Con	saliv, cyan, anor nau	Swallow	Medical attention	
Change:	Daily	PAPRT OVHE/SCBAF/SAF		vomit, abdom cramps, diarr,			
Provide:	Eyewash, Quick drench	10 mg/m ³ : SA PD, PP		sweat, musc/fasc weak,			
		§ SCBAF PD PP/SAF PD PP ASCBA		para, gidd, conf, ataxia,			
		Escape: GMFOVHE/SCBAE		convuls, coma, low BP,			
				cardiomeg			
[Parathion]							
Skin:	N.R.	TBAL	Inh	Irritates eyes, skin, throat,	Eye:	Immediate	Eyes, skin, resp sys
Eyes:	N.R.		Con	upper resp sys	Breath:	Fresh air	
Wash skin:	N.R.						
Remove:	N.R.						
Change:	N.R.						

[Particulates not otherwise regulated]

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Pentaborane B_5H_9 19624-22-7 RY8925000	Pentaboron nonahydride	NIOSH 0.005 ppm (0.01 mg/m ³) ST 0.015 ppm (0.03 mg/m ³) OSHA† 0.005 ppm (0.01 mg/m ³)	1 ppm	Colorless liquid with a pungent odor like sour milk.	MW: 63.1 BP: 140°F Sol: Reacts FLP: 86°F IP: 9.90 eV Sp Gr: 0.62 Class IC Flammable Liquid	VP: 171 mm FRZ: -52°F UEL: ? LEL: 0.42%	Oxidizers, halogens, water, halogenated hydrocarbons [Note: May ignite SPONTANEOUSLY in moist air. Corrosive to natural rubber. Hydrolyzes slowly with heat in water to form boric acid.]	None available
Pentachloroethane $CHCl_2CCl_3$ 76-01-7 K16300000	Ethane pentachloride, Pentalin	NIOSH Handle with caution in the workplace. See Appendix C (Chloroethanes) OSHA none	N.D.	Colorless liquid with a sweetish, chloroform-like odor.	MW: 202.3 BP: 322°F Sol: 0.05% FLP: ? IP: 11.28 eV Sp Gr: 1.68 Combustible Liquid	VP: 3 mm MLT: -20°F UEL: ? LEL: ?	(Sodium-potassium alloy + bromoform), alkalis, metals, water [Note: Hydrolysis produces dichloro- acetic acid. Reaction with alkalis & metals produces spontaneously explosive chloroacetylenes.]	Porapak; Hexane; GC/ECD; ■ [#2517]
Pentachloronaphthalene $C_{10}H_2Cl_4$ 1321-64-8 QK0300000	Halowax® 1013 1,2,3,4,5-Pentachloro- naphthalene	NIOSH/OSHA 0.5 mg/m ³ [skin]	Unknown	Pale-yellow or white solid or powder with an aromatic odor	MW: 300.4 BP: 636°F Sol: Insoluble FLP: NA IP: ? Sp Gr: 1.87 Noncombustible Solid	VP: <1 mm MLT: 248°F UEL: NA LEL: NA	Strong oxidizers	Filter/Bub, isooctane, GC/ECD, ■ [#596]
Pentachlorophenol C_6Cl_5OH 87-86-5 SM5300000	PCP Penta 2,3,4,5,6-Pentachlorophenol	NIOSH/OSHA 0.5 mg/m ³ [skin]	2.5 mg/m ³	Colorless to white crystalline solid with a benzene-like odor [fungicide]	MW: 266.4 BP: 588°F (Decomposes) Sol: 0.001% FLP: NA IP: NA Sp Gr: 1.98 Noncombustible Solid	VP(77°F): 0.0001 mm MLT: 374°F UEL: NA LEL: NA	Strong oxidizers, acids, alkalis	Filter/Bub, Methanol, HPLC/UV/D, ■ [#5512]

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection -- maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 6)	First aid (See Table 6)	Target organs (See Table 6)
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin, dizz,	Eye	Eyes, skin, CNS
Eyes:	Prevent eye contact	0.05 ppm: SA	Abs	head, drow, li-head, mco,	Skin:	Irr immed
Wash skin:	When contam	0.125 ppm: SA CF	ing	tremor, convuls, behavioral	Breath:	Soap wash immed
Remove:	When wet (flamm)	0.25 ppm: SAT CF/SCBAF/SAF	Con	change; tonic spasm face,	Swallow:	Resp support
Change:	N.R.	1 ppm: SA, PD, PP		neck, abdomen, limbs		Medical attention immed
Provide:	Eyewash, Quick drench	5 SCBAF PD PP/SAF PD, PP ASCBA				
		Escape: GMFS/SCBAE				
[Pentaborane]						
Skin:	Prevent skin contact	TBAL	Inh	In animals: irrit eyes,	Eye:	Eyes, skin, resp sys,
Eyes:	Prevent eye contact		Abs	skin; weak, restless, irreg	Skin:	CNS, liver, kidneys
Wash skin:	When contam		ing	respiration, muscle inco;	Breath:	
Remove:	When wet or contam		Con	liver, kidney, lung changes	Swallow:	
Change:	N.R.					
Provide:	Eyewash, Quick drench					
[Pentachloroethane]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Head, fig, verti, anor,	Eye	Skin, liver, CNS
Eyes:	Prevent eye contact	5 mg/m ³ SA ⁷ /SCBAF	Abs	pruritus, acne-form skin	Skin:	
Wash skin:	When contam	5 SCBAF PD PP/SAF PD, PP ASCBA	ing	eruptions; jaun, liver nec	Breath:	
Remove:	When wet or contam	Escape: GMFOVHE/SCBAE	Con		Swallow:	
Change:	Daily					
[Pentachloronaphthalene]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, nose, throat,	Eye	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	2.8 mg/m ³ : CCROVDMFu ¹ /PAPROVDMFu ¹	Abs	sneez, cough, weak,	Skin:	CNS, liver, kidneys,
Wash skin:	When contam	SA ⁷ /SCBAF	ing	anor, low-fig; sweat;	Breath:	CNS
Remove:	When wet or contam	5 SCBAF PD PP/SAF PD, PP ASCBA	Con	head, dizz, neu vomit,	Swallow:	
Change:	Daily	Escape: GMFOVHE/SCBAE		dysp, chest pain; high		
Provide:	Eyewash, Quick drench			fever, dermat		

[Pentachloronaphthalene]

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL F.P., IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Pentaerythritol $C(CH_2OH)_4$ 115-77-6 RZ2490000	2,2-bis(Hydroxymethyl)- 1,3-propanediol; Methane tetramethylol; Monopentaerythritol; PE; Tetrahydroxymethylmethane; Tetramethylolmethane	NIOSH 10 mg/m ³ (total) 5 mg/m ³ (resp) OSHA† 15 mg/m ³ (total) 5 mg/m ³ (resp)	N.D.	Colorless to white, crystalline, odorless powder. [Note: Technical grade is 88% monopentaerythritol & 12% dipentaerythritol.]	MW: 136.2 BP: Sublimes Sol(59°F): 6% F.P. ? IP: ? Sp Gr: 1.38 Combustible Solid	VP: 0 mm (approx) MLT: 500°F (Sublimes) UEL: ? LEL: ?	Organic acids, oxidizers [Note: Explosive compound is formed when a mixture of PE & thiophosphoryl chloride is heated.]	Filter: none; Grav; III [Nuisance Dust: #0500 (total), #0600 (resp)]
n-Pentane $CH_3(CH_2)_3CH_3$ 109-66-0 RZ9450000	Pentane normal-Pentane	NIOSH 120 ppm (350 mg/m ³) C 610 ppm (1820 mg/m ³) [15-min] OSHA† 1000 ppm (2950 mg/m ³)	1500 ppm [LEL]	Colorless liquid with a gasoline- like odor [Note: A gas above 97°F. May be utilized as a fuel.]	MW: 72.2 BP: 97°F Sol: 0.04% F.P. -52°F IP: 10-34 eV Sp Gr: 0.63 Class IA Flammable Liquid	VP: 420 mm FRZ: -202°F UEL: 7.6% LEL: 1.5%	Strong oxidizers	Char, CS, GC/FID, III [#1500, Hydro- carbons]
1-Pentanethiol $CH_3(CH_2)_4SH$ 110-66-7 SA3150000	Amyl hydrosulfide, Amyl mercaptan, Amyl sulphydrate, Pentyl mercaptan	NIOSH C 0.5 ppm (2.1 mg/m ³) [15-min] OSHA none	N.D.	Water-white to yellowish liquid with a strong, garlic-like odor.	MW: 104.2 BP: 260°F Sol: Insoluble F.P.(oc): 65°F IP: ? Sp Gr: 0.84 Class IB Flammable Liquid	VP(77°F): 14 mm FRZ: -104°F UEL: ? LEL: ?	Oxidizers, reducing agents, alkali metals, calcium hypochlorite, concentrated nitric acid	None available
1111 27	1 ppm = 4.33 mg/m ³							
2-Pentanone $CH_3COCH_2CH_2CH_3$ 107-87-9 SA7875000	Ethyl acetone Methyl propyl ketone, MPK	NIOSH 150 ppm (530 mg/m ³) OSHA† 200 ppm (700 mg/m ³)	1500 ppm	Colorless to water-white liquid with a characteristic acetone-like odor	MW: 86.1 BP: 215°F Sol: 6% F.P. 45°F IP: 5-39 eV Sp Gr: 0.81	VP: 27 mm FRZ: -108°F UEL: 8.2% LEL: 1.5%	Oxidizers, bromine trifluoride	Char, CS, GC/FID, III [#1300 Ketones I]

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)	
Skin:	N.R.	TBAL	Inh ing Con	Irritates eyes, resp sys	Eye: Skin: Breath: Swallow:	Irritated Water wash Fresh air Medical attention immed	Eyes, resp sys
Eyes:	N.R.						
Wash skin:	N.R.						
Remove:	N.R.						
Change:	N.R.						
[Pentacrythol]							
Skin:	Prevent skin contact	NIOSH	Inh	Irritates skin, nose	Eye	Irritated	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	1200 ppm: SA	ing	derm, chemical pneu (aspir	Skin	Water wash prompt	CNS
Wash skin:	When contam	1500 ppm: SA, CF/SCBAF/SAF	Con	liq); drow	Breath	Resp support	
Remove:	When wet (flamm)	§ SCBAF, PD, PP/SAF, PD, PP, ASCBA		in animals: narco	Swallow	Medical attention immed	
Change:	N.R.	Escape: GMFOV/SCBAE					
[n-Pentane]							
Skin:	Prevent skin contact	NIOSH	Inh	Irritates skin, nose,	Eye:	Irritated	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	5 ppm: CCRFOV/SA	ing	throat, resp sys, head,	Skin:	Soap wash immed	CNS
Wash skin:	When contam	12.5 ppm: SA, CF/PAPROV	Con	nausea, dizziness, vomit, diarr;	Breath:	Resp support	
Remove:	When wet (flamm)	25 ppm: CCRFOV/GMFOV/PAPROV/		derm, skin sens	Swallow:	Medical attention immed	
Change:	N.R.	§ SCBAF/SAF					
		§ SCBAF, PD, PP/SAF, PD, PP, ASCBA					
		Escape: GMFOV/SCBAE					
[1-Pentanethiol]							
Skin:	Prevent skin contact	NIOSH	Inh	Irritates skin, muc memb	Eye	Irritated	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	1500 ppm: CCRFOV/PAPROV/GMFOV/	ing	head, derm, narco, coma	Skin	Water wash	CNS
Wash skin:	When contam	SA/SCBAF	Con		Breath	Resp support	
Remove:	When wet (flamm)	§ SCBAF, PD, PP/SAF, PD, PP, ASCBA			Swallow	Medical attention immed	
Change:	N.R.	Escape: GMFOV/SCBAE					
[2-Pentanone]							

Chemical name, structure formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Perchloromethyl mercaptan Cl_3CSCl 594-42-3 PB0370000	PCM, PMM, Trichloromethane sulfonyl chloride, Trichloromethyl sulfur chloride	NIOSH/OSHA 0.1 ppm (0.6 mg/m ³)	10 ppm	Pale-yellow, oily liquid with an unbearable, acrid odor.	MW: 185.9 BP: 297°F (Decomposes) Sol: Insoluble FLP: NA IP: ?	VP: 3 mm FRZ: ? UEL: NA LEL: NA	Alkalis, amines, hot iron, water [Note: Corrosive to most metals. Forms HCl, sulfur & CO ₂ on contact with water.]	None available
1670 55	1 ppm = 7.73 mg/m ³				Sp Gr: 1.69 Noncombustible Liquid, but will support combustion.			
Perchloryl fluoride ClO_2F 7616-94-6 SD1925000	Chlorine fluoride oxide, Chlorine oxyfluoride, Trichlorofluoride	NIOSH 3 ppm (14 mg/m ³) ST 6 ppm (28 mg/m ³) OSHA† 3 ppm (13.5 mg/m ³)	100 ppm	Colorless gas with a characteristic, sweet odor [Note: Shipped as a liquefied compressed gas.]	MW: 102.5 BP: -52°F Sol: 0.06% FLP: NA IP: 13.60 eV	VP: 10.5 atm FRZ: -234°F UEL: NA LEL: NA	Combustibles, strong bases, amines, finely divided metals, reducing agents, alcohols	None available
3083 20	1 ppm = 4.26 mg/m ³				RGasD: 3.64 Nonflammable Gas, but will support combustion.			
Perlite 93763-70-3 SO5254000	Expanded perlite [Note: An amorphous material consisting of fused sodium/potassium aluminosilicate.]	NIOSH 10 mg/m ³ (total) 5 mg/m ³ (resp) OSHA 15 mg/m ³ (total) 5 mg/m ³ (resp)	N.D.	Odorless, light- gray to glassy- black solid. [Note: Expanded perlite is a fluffy, white particulate.]	MW: varies BP: ? Sol: <1% FLP: NA IP: NA Sp. Gr: 2.2-2.4 (crude) 0.05-0.3 (expanded) Noncombustible Solid	VP: 0 mm (approx) MLT: >2000°F UEL: NA LEL: NA	None reported	Filter; none; Grav; III [Irritation Dust; #0500 (total), #0600 (resp)]
Petroleum distillates (naphtha) 8002-05-9 SE7449000	Aliphatic petroleum naphtha, Petroleum naphtha, Rubbersolvent	NIOSH 350 mg/m ³ C 1800 mg/m ³ [15-min] OSHA† 500 ppm (2000 mg/m ³)	1100 ppm [LEL]	Colorless liquid with a gasoline- or kerosene-like odor. [Note: A mixture of paraffins (C ₆ to C ₁₂) that may contain a small amount of aromatic hydrocarbons.]	MW: 99 (approx) BP: 86-460°F Sol: Insoluble FLP: -40 to -86°F IP: ? Sp Gr: 0.63-0.66 Flammable Liquid	VP: 40 mm (approx) FRZ: -99°F UEL: 5.9% LEL: 1.1%	Strong oxidizers	Char, CS, GC/FID; III [#1550, Naphthas]
1255 27	1 ppm = 4.11 mg/m ³ (approx)							

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Route	Symptoms (See Table 5)	Health hazards		
					First aid (See Table 6)	Target organs (See Table 5)	
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irritates skin, nose,	Eye	Irritated	Eyes, skin, resp sys.
Eyes:	Prevent eye contact	1 ppm CCRDV*/SA*	Abs	throat, lac. cough,	Skin	Soap wash immed	liver, kidneys
Wash skin:	When contam	2.5 ppm SA CF*/PAPROV*	Ing	dysp, deep breath pain,	Breath	Resp support	
Remove:	When wet or contam	5 ppm CCRF OV/GMFOV/PAPROV*/	Con	coarse rales, vomit,	Swallow	Medical attention	
Change:	N.R.	SAT CF*/SCBAF/SAF		palor, tacer, acidosis,		immed	
		10 ppm SAF PD PP		anuria, liver, kidney			
		5 SCBAF PD PP/SAF PD PP ASCBA		damage			
		Escape GMFOV/SCBAE					
[Perchloromethyl mercaptan]							
Skin:	Frostbite	NIOSH/OSHA	Inh	Irr resp sys,	Eye:	Frostbite	Skin, resp sys, blood
Eyes:	Frostbite	30 ppm SA	Con	liq: frostbite;	Skin:	Frostbite	
Wash skin:	N.R.	75 ppm SA CF*	(liq)	in animals methemo	Breath	Resp support	
Remove:	N.R.	100 ppm SCBAF/SAF		cyan weak dizz head,			
Change:	N.R.	5 SCBAF PD PP/SAF PD PP ASCBA		pum edema, pneumis,			
Provide:	Frostbite	Escape GMFS/SCBAE		anoxia			
[Perchloryl fluoride]							
Skin:	N.R.	TBAL	Inh	Irrit eyes, skin, throat,	Eye:	Irritated	Eyes, skin, resp sys
Eyes:	N.R.		Con	upper resp sys	Breath:	Fresh air	
Wash skin:	N.R.						
Remove:	N.R.						
Change:	N.R.						
[Perlite]							
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, nose, throat,	Eye	Irritated	Eyes, skin, resp sys.
Eyes:	Prevent eye contact	850 ppm SA	Ing	dizz, drow head, nau,	Skin	Soap wash prompt	CNS
Wash skin:	When contam	1100 ppm SA CF*/SCBAF/SAF	Con	dry cracked skin, chemical	Breath	Resp support	
Remove:	When wet (flam)	5 SCBAF PD PP/SAF PD PP ASCBA		pneu (aspir liq)	Swallow	Medical Attention	
Change:	N.R.	Escape GMFOV/SCBAE				immed	
[Petroleum distillates (naphtha)]							

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL, F.P., IP, Sp. Gr., flammability	VP, FRZ UEL, LEL		
Phenol C_6H_5OH 108-95-2 SJ3325000 1671 55 (solid) 2312 55 (molten) 2821 55 (solution)	Carbolic acid. Hydroxybenzene. Monohydroxybenzene. Phenyl alcohol. Phenyl hydroxide 1 ppm = 3.91 mg/m³	NIOSH 5 ppm (19 mg/m ³) C 15.6 ppm (60 mg/m ³) (15-min) [skin] OSHA 5 ppm (19 mg/m ³) [skin]	250 ppm	Colorless to light-pink, crystalline solid with a sweet, acid odor. [Note: Phenol liquefies by mixing with about 8% water.]	MW 94.1 BP 359°F Sol: (77°F) 9% F.P. 175°F IP: 8.50 eV Sp Gr. 1.06 Combustible Solid	VP 0.4 mm MLT 109°F UEL 8.6% LEL 1.8%	Strong oxidizers, calcium hypochlorite, aluminum chloride, acids	XAD-7; Methanol; HPLC/UV/D; OSHA [#32]
Phenothiazine $S(C_6H_4)_3NH$ 92-84-2 SN5075000	Dibenzothiazine, Fenothiazine, Thiodiphenylamine	NIOSH 5 mg/m ³ [skin] OSHA† none	N.D.	Grayish-green to greenish-yellow solid. [Insecticide]	MW: 198.3 BP: 700°F Sol: Insoluble F.P.: ? IP: ? Sp. Gr.: ? Combustible Solid, but not a high fire risk.	VP: 0 mm (approx) MLT: 365°F UEL: ? LEL: ?	None reported	None available
p-Phenylene diamine $C_6H_4(NH_2)_2$ 106-50-3 SS8050000 1673 53	4-Aminoaniline, 1,4-Benzenediamine; p-Diaminobenzene, 1,4-Diaminobenzene, 1,4-Phenylene diamine	NIOSH/OSHA 0.1 mg/m ³ [skin]	25 mg/m ³	White to slightly red, crystalline solid	MW 108.2 BP 513°F Sol (75°F): 4% F.P. 312°F IP 6.89 eV Sp Gr. ? Combustible Solid	VP <1 mm MLT 295°F UEL: ? LEL: ?	Strong oxidizers	Filter*; EDTA; HPLC/UV/D; OSHA [#87]
Phenyl ether (vapor) $C_6H_5OC_6H_5$ 101-84-8 KN8970000	Diphenyl ether, Diphenyl oxide, Phenoxy benzene, Phenyl oxide	NIOSH/OSHA 1 ppm (7 mg/m ³)	100 ppm	Colorless, crystalline solid or liquid (above 82°F) with a perianth-like odor	MW 170.2 BP 498°F Sol Insoluble F.P. 239°F IP: 8.09 eV Sp Gr. 1.08 Combustible Solid Class. IIIB Combustible Liquid	VP (77°F) 0.02 mm MLT 82°F UEL 6.0% LEL 0.7%	Strong oxidizers	Char; CS; GC/FID; ■ [#572]

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily Provide: Eyewash, Quick drench		NIOSH/OSHA 50 ppm CCR/ODM/SA 125 ppm SA CF/PAPROVDM 250 ppm CCRFOVHE/GMFOVHE/ PAPROVHE/SCBAF/SAF § SCBAF PD PP/SAF PD PP ASCBA Escape GMFOVHE/SCBAE	Inh Abs Ing Con	Irrit eyes, nose, throat, anor, low-wgt, weak, muscle ache, pain, dark urine, cyan, liver, kidney damage, skin burns, derm, ochronosis, tremor, convuls, twitch	Eye Skin Breath Swallow Irrigated Soap wash, irrigated Resp support Medical attention Irrigated	Eyes, skin, resp sys, liver, kidneys
[Phenol]						
Skin: Prevent skin contact Eyes: N.R. Wash skin: When contam/Daily Remove: When wet or contam Change: Daily		TBAL	Inh Abs Ing Con	Itching, irrit, reddening skin; hepatitis, hemolytic anemia, abdom cramps, tacer; kidney damage; skin photo sens	Eye Skin Breath Swallow Irrigated Soap wash prompt Resp support Medical attention Irrigated	Skin, CVS, liver, kidneys
[Phenothiazine]						
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam/Daily Remove: When wet or contam Change: Daily		NIOSH/OSHA 2.5 mg/m ³ SA CF 5 mg/m ³ SCBAF/SAF 25 mg/m ³ SAF PD, PP § SCBAF PD PP/SAF PD, PP ASCBA Escape GMFSHE/SCBAE	Inh Abs Ing Con	Irrit pharynx, larynx, bronchial asthma, sens derm	Eye Skin Breath Swallow Irrigated Soap wash prompt Resp support Medical attention Irrigated	Resp sys, skin
[p-Phenylene diamine]						
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R.		NIOSH/OSHA 25 ppm SA CF/PAPROVDM 50 ppm CCRFOVHE/GMFOVHE/ SCBAF/SAF 100 ppm SAF PD, PP § SCBAF PD PP/SAF PD, PP ASCBA Escape GMFOVHE/SCBAE	Inh Con	Irrit eyes, nose, skin, nau	Eye Skin Breath Irrigated Soap wash prompt Resp support	Eyes, skin, resp sys
[Phenyl ether (vapor)]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P., IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Phenylether-biphenyl mixture (vapor) $C_{12}H_{10}OC_6H_4C_6H_5$ 8004-13-5 DV1500000	Diphenyl oxide-diphenyl mixture, Dowtherm® A	NIOSH/OSHA 1 ppm (7 mg/m ³)	10 ppm	Colorless to straw-colored liquid or solid (below 54°F) with a disagreeable, aromatic odor. [Note: A mixture typically contains 75% phenylether & 25% biphenyl.]	MW: 166 (approx) BP: 495°F Sol: Insoluble Fl.P.: 239°F IP: ? Sp Gr (77°F): 1.06 Class IIIB Combustible Liquid	VP (77°F): 0.08 mm FRZ: 54°F UEL: ? LEL: ?	Strong oxidizers	Sig. el. Benzene; GC/FID; ■ [#S73]
Phenyl glycidyl ether $C_{10}H_{10}O_2$ 122-60-1 TZ3675000	1,2-Epoxy-3-phenoxy propane, Glycidyl phenyl ether, PGE, Phenyl 2,3-epoxypropyl ether	NIOSH Ca See Appendix A C: 1 ppm (6 mg/m ³) [15-min] OSHA† 10 ppm (60 mg/m ³)	Ca [100 ppm]	Colorless liquid. [Note: A solid below 38°F.]	MW: 150.1 BP: 473°F Sol: 0.2% Fl.P.: 248°F IP: ? Sp Gr: 1.11 Class IIIB Combustible Liquid	VP: 0.01 mm FRZ: 38°F UEL: ? LEL: ?	Strong oxidizers, amines, strong acids, strong bases	Char; CS; GC/FID; ■ [#S74]
Phenyldiazine $C_6H_8N_2$ 100-63-0 MW8925000	Hydrazinobenzene, Monophenyldiazine	NIOSH Ca See Appendix A C: 0.14 ppm [skin] [0.6 mg/m ³] [2-hr] OSHA† 5 ppm (22 mg/m ³) [skin]	Ca [15 ppm]	Colorless to pale- yellow liquid or solid (below 67°F) with a faint, aromatic odor.	MW: 108.1 BP: 470°F (Decomposes) Sol: Slight Fl.P.: 190°F IP: 7.64 eV Sp Gr: 1.10 Class IIIA Combustible Liquid Combustible Solid	VP (77°F): 0.04 mm FRZ: 67°F UEL: ? LEL: ?	Strong oxidizers, lead dioxide	Sub; Pho-acid, Vis; ■ [#S160]
N-Phenyl-6-naphthyl- amine $C_{19}H_{17}N$ 135-88-6 QM4550000	2-Anilino-naphthalene, 6-Naphthylphenylamine, PBNA, 2-Phenylaminonaphthalene, Phenyl-6-naphthylamine	NIOSH Ca* See Appendix A [Note: Since metabolized to 6-Naphthylamine.] OSHA none	Ca [N.D.]	White to yellow crystals or gray to tan flakes or powder. [Note: Commercial product may con- tain 20-30 ppm of 6-naphthylamine.]	MW: 219.3 BP: 743°F Sol: Insoluble Fl.P.: ? IP: ? Sp Gr: 1.24 Combustible Solid	VP: ? MLT: 226°F UEL: ? LEL: ?	Oxidizers	None available

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 6)
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R.		NIOSH/OSHA 10 ppm: SA:CF/CCRFOVHI/ GMFOVHI/PAPROVDM/ SCBAF/SAF § SCBAF PD PP/SAF PD PP ASCBA Escape GMFOVHI/SCBAE	Inh Con	Irrit eyes, nose, skin, nau	Eye Skin Breath: Irrimed Soap wash prompt Resp support	Eyes, skin, resp sys
[Phenyl ether-biphenyl mixture (vapor)]						
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R. Provide: Eyewash, Quick drench		NIOSH § SCBAF PD PP/SAF PD PP ASCBA Escape GMFOVHI/SCBAE	Inh Abs Ing Con	Irrit eyes, skin, upper resp sys, skin sens, narco, possible hemato, repro effects; [carc]	Eye Skin Breath: Swallow Irrimed Soap wash prompt Resp support Medical attention immed	Eyes, skin, CNS, hemato sys, repro sys [in animals: nasal cancer]
[Phenyl glycidyl ether]						
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam/Daily Remove: When wet or contam Change: Daily Provide: Eyewash, Quick drench		NIOSH § SCBAF PD PP/SAF PD PP ASCBA Escape SCBAE	Inh Abs Ing Con	Skin sens, hemolytic anemia, dysp, cyan, jaun, kidney damage, vascular thrombosis, [carc]	Eye Skin Breath: Swallow Irrimed Soap wash immed Resp support Medical attention immed	Blood, resp sys, liver, kidneys, skin [in animals: tumors of the lungs, liver, blood vessels & intestine]
[Phenylhydrazine]						
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam/Daily Remove: When wet or contam Change: Daily Provide: Eyewash, Quick drench		NIOSH § SCBAF PD PP/SAF PD PP ASCBA Escape GMFOVHI/SCBAE	Inh Abs Ing Con	Irritation; leukoplakia; acne; hypersensitivity to sunlight; [carc]	Eye: Skin: Breath: Swallow: Irr immed Soap wash immed Resp support Medical attention immed	Eyes, skin, bladder [bladder cancer]
[N-Phenyl-6-naphthylamine]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL F.P., IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Phenylphosphine $C_6H_5PH_2$ 638-21-1 S22100000	Fenylfosfin, PF, Phosphaniline	NIOSH C 0.05 ppm (0.25 mg/m ³) OSHA† none	N.D.	Clear, colorless liquid with a foul odor.	MW: 110.1 BP: 320°F Sol: Insoluble F.P.: 7 IP: 7	VP: 7 FRZ: 7 UEL: 7 LEL: 7	None reported [Note: Spontaneously combustible in high concentrations in air. Potential exposure to gaseous phenylphosphine when polyphosphinates are heated above 392°F.]	None available
1 ppm = 4.58 mg/m ³					Sp Gr(59°F): 1.001 Combustible Liquid			
Phorate $(C_2H_5O)_2P(S)SCH_2SC_2H_5$ 298-02-2 T09450000	O,O-Diethyl S-(ethylthio)- methylphosphorodithioate; O,O-Diethyl S-ethylthio- methylthioisopropylphosphate; Thimet; Timet	NIOSH 0.05 mg/m ³ ST 0.2 mg/m ³ [skin] OSHA† none	N.D.	Clear liquid with a skunk-like odor. [insecticide]	MW: 260.4 BP: 7 Sol: 0.005% F.P.(oc): 320°F IP: 7	VP: 0.0008 mm FRZ: -45°F UEL: 7 LEL: 7	Water, alkalis [Note: Hydrolyzed in the presence of moisture and by alkalis.]	None available
3018 55 (organo-phosphorus pesticide, n.o.s.)					Sp Gr(77°F): 1.16 Class IIIB Combustible Liquid, but does not readily ignite.			
Phosdrin® $C_2H_5PO_3$ 7786-34-7 GQ5250000	2-Carbomethoxy-1-methylvinyl dimethyl phosphate, Mevinphos [Note: Commercial product is a mixture of the cis- & trans isomers.] $(CH_3CO)_2P(O)OC(CH_3)=CHCOOCH_3$	NIOSH 0.01 ppm (0.1 mg/m ³) ST 0.03 ppm (0.3 mg/m ³) [skin] OSHA† 0.1 mg/m ³ [skin]	4 ppm	Pale-yellow to orange liquid with a weak odor [Note: Insecticide that may be absorbed on a dry carrier.]	MW: 224.2 BP: Decomposes Sol: Miscible F.P.(oc): 347°F IP: 7	VP: 0.003 mm FRZ: 44°F (trans-) 70°F (cis-) UEL: 7 LEL: 7	Strong oxidizers [Note: Corrosive to cast iron, some stainless steels & brass.]	Chrom-102, Toluene GC/FPD, III [#2503]
2783 55					Sp Gr: 1.25 Class IIIB Combustible Liquid			
Phosgene $COCl_2$ 75-44-5 SY5600000	Carbon oxychloride, Carbonyl chloride Carbonyl dichloride Chloroformyl chloride	NIOSH 0.1 ppm (0.4 mg/m ³) C 0.2 ppm (0.8 mg/m ³) (15-min) OSHA 0.1 ppm (0.4 mg/m ³)	2 ppm	Colorless gas with a suffocating odor like musty hay [Note: A flammable liquid below 47°F. Shipped as a liquefied compressed gas.]	MW: 98.9 BP: 47°F Sol: Slight F.P.: NA IP: 11.55eV	VP: 1.6 atm FRZ: -198°F UEL: NA LEL: NA	Moisture, alkalis, ammonia, alcohols, copper [Note: Reacts slowly in water to form hydrochloric acid & carbon dioxide.]	Imp Reagent, Vis III [P&CAM #219]
1076 15					RGasD: 3.48 Sp Gr: 1.43 (Liquid at 32°F) Nonflammable Gas			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 6)	
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact Daily When wet or contam N.R.	TBAL	Inh Ing Con	In animals: blood changes, anemia, testicular degeneration; loss of appetite, diarr, lac, hindleg tremor; derm	Eye: Skin: Breath: Swallow:	Irr immed Soap wash Resp support Medical attention immed	Blood, CNS, skin, repro sys
[Phenylphosphine]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R. Eyewash, Quick drench	TBAL	Inh Abs Ing Con	Irrit eyes, skin, resp sys; miosis; rhin; head, chest tight, wheez, lar spasm, saliv, cyan, anor, nau, vomit, abdom cramps, diarr; sweat, muscle fasc, weak, para; gidd, conf, ataxia; convuls, coma; low BP; card irreg	Eye: Skin: Breath: Swallow:	Irr immed Soap flush immed Resp support Medical attention immed	Eyes, skin, resp sys, CNS, CVS, blood chol
[Phorate]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R. Eyewash, Quick drench	NIOSH/OSHA 0.1 ppm SA 0.25 ppm SA CF 0.5 ppm SAT CF/SCBAF/SAF 4 ppm SA PD PP 6 SCBAF PD PP/SAF PD PP ASCBA Escape: GMFOVHE/SCBAE	Inh Abs Ing Con	Irrit eyes, skin, resp sys; miosis; rhin; head, chest tight, wheez, lar spasm, saliv, cyan, anor, nau, vomit, abdom cramps, diarr, para ataxia convuls, low BP, card irreg	Eye Skin Breath Swallow	Irr immed Soap wash immed Resp support Medical attention immed	Eyes, skin, resp sys, CNS, CVS, blood chol
[Phosdrin®]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact (liq) Prevent eye contact (liq) When contam (liq) When wet or contam (liq) N.R. Quick drench (liq)	NIOSH/OSHA 1 ppm SA* 2 ppm SCBAF/SAF 6 SCBAF PD PP/SAF PD PP ASCBA Escape: GMFS/SCBAE	Inh Con (liq)	Irrit eyes, dry burning throat, vomit, cough, foamy sputum, dysp, chest pain, cyan, liq: frostbite	Eye Skin Breath	Irr immed (liq) Water flush immed (liq) Resp support	Eyes, skin, resp sys

Chemical name, structural formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Phosphine PH_3 7803-51-2 SY7525000	Hydrogen phosphide, Phosphorated hydrogen, Phosphorus hydride, Phosphorus trihydride	NIOSH 0.3 ppm (0.4 mg/m ³) ST 1 ppm (1 mg/m ³) OSHA† 0.3 ppm (0.4 mg/m ³)	60 ppm	Colorless gas with a fish- or garlic- like odor [pesticide] [Note: Shipped as a liquefied compressed gas. Pure compound is odorless.]	MW: 34.0 BP: -126°F Sol: Slight FIP: NA (Gas) IP: 9.96 eV	VP: 41.3 atm FRZ: -209°F UEL: ? LEL: 1.79%	Air, oxidizers, chlorine, acids, moisture, halogenated hydrocarbons, copper IC; [Note: May ignite SPONTANEOUSLY on contact with air.]	Beaded carbon; H_2O / buffer; IC; OSHA [HID160]
2199 18	1 ppm = 1.41 mg/m ³				RGasD: 1.18 Flammable Gas			
Phosphoric acid H_3PO_4 7664-38-2 TB6300000	Orthophosphoric acid, Phosphoric acid (aqueous), White phosphoric acid	NIOSH 1 mg/m ³ ST 3 mg/m ³ OSHA† 1 mg/m ³	1000 mg/m ³	Thick, colorless, odorless, crystalline solid [Note: Often used in an aqueous solution.]	MW: 98.0 BP: 415°F Sol: Miscible FIP: NA IP: ? Sp Gr(77°F): 1.87 (pure) 1.33 (50% soln.)	VP: 0.03 mm MLT: 108°F UEL: NA LEL: NA	Strong caustics, most metals [Note: Readily reacts with metals to form flammable hydrogen gas. DO NOT MIX WITH SOLUTIONS CONTAINING BLEACH OR AMMONIA.]	Sigelt; NaHCO_3 / Na_2CO_3 ; IC, III [#7903; Inorganic Acids]
1805 60	1 ppm = 4.07 mg/m ³				Noncombustible Liquid			
Phosphorus (yellow) P_4 7723-14-0 TH3500000	Elemental phosphorus White phosphorus	NIOSH/OSHA 0.1 mg/m ³	5 mg/m ³	White to yellow, soft, waxy solid with acid fumes in air [Note: Usually shipped or stored in water.]	MW: 124.0 BP: 536°F Sol: 0.0003% FIP: ? IP: ? Sp Gr: 1.82	VP: 0.03 mm MLT: 111°F UEL: ? LEL: ?	Air, oxidizers (including elemental sulfur & strong caustics), halogens [Note: Ignites SPONTANEOUSLY in moist air.]	Tenax GC, Xylene, GC/FPD, III [#7905]
1381 38					Flammable Solid			
Phosphorus oxychloride POCl_3 10025-87-3 TH487000	Phosphorus chloride, Phosphorus oxytrichloride, Phosphoryl chloride	NIOSH 0.1 ppm (0.6 mg/m ³) ST 0.5 ppm (3 mg/m ³) OSHA† none	N.D.	Clear, colorless to yellow, oily liquid with a pungent & musty odor. [Note: A solid below 34°F.]	MW: 153.3 BP: 222°F Sol: Decomposes FLP: NA IP: ? Sp Gr(77°F): 1.83	VP(81°F): 40 mm FRZ: 34°F UEL: NA LEL: NA	Water, combustible materials, carbon disulfide, dimethyl- formamide, metals (except nickel & lead) [Note: Decomposes in water to hydrochloric & phosphoric acids.]	None available
**** 00	1 ppm = 8.37 mg/m ³				Noncombustible Liquid, but may set fire to combustible materials.			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 8)	
Skin: Eyes: Wash skin: Remove: Change: Provide:	Frostbite Frostbite N.R. When wet (flamms) N.R. Frostbite	NIOSH/OSHA 3 ppm: SA 7.5 ppm: SA, CF 15 ppm: GMFS/SCBAF/SAF 50 ppm: SA, PD, PP § SCBAF, PD, PP/SAF, PD, PP, ASCBA Escape: GMFS/SCBAE	Inh Con (Eq)	Nau, vomit, abdom pain, diarr, thirst, chest tight, dysp, muscle pain, chills stupor or syncope, pulm edema, liq, frostbite	Eye: Skin: Breath:	Frostbite Frostbite Resp support	Resp sys
[Phosphine]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam Daily Eyewash (>1.5%), Quick drench (>1.5%)	NIOSH/OSHA 25 mg/m ³ : SA, CF* 50 mg/m ³ : HiEF/SCBAF/SAF 1000 mg/m ³ : SAF, PD, PP § SCBAF, PD, PP/SAF, PD, PP, ASCBA Escape: HiEF/SCBAE	Inh Ing Con	Irrit eyes, skin, upper resp sys; eye, skin burns, derm	Eye Skin Breath: Swallow	Irrimed Water flush Immed Resp support Medical attention immed	Eyes, skin, resp sys
[Phosphoric acid]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact* Prevent eye contact When contam When wet or contam Daily Eyewash, Quick drench [*Note: Flame retardant personal protective equipment should be provided.]	NIOSH/OSHA 1 mg/m ³ : SA 2.5 mg/m ³ : SA, CF* 5 mg/m ³ : SCBAF/SAF § SCBAF, PD, PP/SAF, PD, PP, ASCBA Escape: SCBAE	Inh Ing Con	Irrit eyes, resp tract, eye, skin burns, abdom pain, nau, jaun, anemia, cachexia, dental pain, saliv, jaw pain, swell	Eye Skin Breath: Swallow	Irrimed Water flush Immed Resp support Medical attention immed	Eyes, skin, resp sys, liver, kidneys, jaw, teeth, blood
[Phosphorus (yellow)]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R. Eyewash, Quick drench	TBAL	Inh Ing Con	Irrit eyes, skin, resp sys; eye, skin burns; dysp, cough, lung edema; dizz, head, weak; abdom pain, nau, vomit; neph	Eye: Skin: Breath: Swallow:	Irrimed Water flush Immed Resp support Medical attention immed	Eyes, skin, resp sys, CNS, kidneys
[Phosphorus oxychloride]							

Chemical name, structure/formula, CAS and RTECS No., and DOT ID and guide No.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P., IP, Sp. Gr, flammability	VP, FRZ UEL, LEL		
Phosphorus pentachloride PCl ₅ 10026-13-8 TB6125000 1806 39	Pentachlorophosphorus, Phosphoric chloride, Phosphorus perchloride	NIOSH/OSHA 1 mg/m ³	78 mg/m ³	White to pale- yellow, crystal- line solid with a pungent, unpleasant odor	MW 208.3 BP Sublimes Sol. Reacts Fl.P. NA IP ? Sp.Gr: 3.60 Noncombustible Solid	VP (132°F): 1mm MLT 324°F (Sublimes) UEL NA LEL NA	Water, magnesium oxide, chemically- active metals such as sodium & potassium, alkalis, amines [Note: Hydrolyzes in water (even in humid air) to form hydrochloric acid & phosphoric acid Corrosive to metals.]	Filter/Bub. Reagent, Vis. II(5) [#S257]
Phosphorus pentasulfide P ₂ S ₅ /P ₄ S ₁₀ 1314-80-3 TH4375000 1340 41	Phosphorus persulfide, Phosphorus sulfide, Sulfur phosphide	NIOSH 1 mg/m ³ ST 3 mg/m ³ OSHA† 1 mg/m ³	250 mg/m ³	Greenish-gray to yellow, crystal- line solid with an odor of rotten eggs.	MW 222.3/ 444.6 BP 957°F Sol. Reacts Fl.P. ? IP. ? Sp Gr: 2.09 Flammable Solid, which may SPONTANEOUSLY ignite in presence of moisture.	VP (572°F): 1mm MLT 550°F UEL ? LEL ?	Water, alcohols, strong oxidizers, acids, alkalis [Note: Reacts with water to form hydrogen sulfide, sulfur dioxide, and phosphoric acid.]	None available
Phosphorus trichloride PCl ₃ 7719-12-2 TH3675000 1809 39	Phosphorus chloride	NIOSH 0.2 ppm (1.5 mg/m ³) ST 0.5 ppm (3 mg/m ³) OSHA† 0.8 ppm (3 mg/m ³)	25 ppm	Colorless to yellow, fuming liquid with an odor like hydrochloric acid.	MW 137.4 BP 169°F Sol. Reacts Fl.P. NA IP: 9.91 eV Sp Gr: 1.58 Noncombustible Liquid; however, a strong oxidizer that may ignite combustibles upon contact.	VP 100 mm FRZ -170°F UEL NA LEL NA	Water, chemically- active metals such as sodium & potassium, aluminum, strong nitric acid, acetic acid, organic matter [Note: Hydrolyzes in water to form hydrochloric acid and phosphoric acid.]	Bub Reagent, Vis. II, [#6402]
Phthalic anhydride C ₈ H ₄ (CO) ₂ O 85-44-9 T13150000 2214 80	1,2-Benzenedicarboxylic anhydride, PAN, Phthalic acid anhydride	NIOSH 6 mg/m ³ (1 ppm) OSHA† 12 mg/m ³ (2 ppm)	80 mg/m ³	White solid (flake) or a clear, colorless liquid (molten) with a characteristic, acid odor.	MW 148.1 BP 563°F Sol. 0.6% Fl.P. 305°F IP: 10.00 eV Sp Gr: 1.53 (Flake) 1.20 (Molten) Combustible Solid	VP 0.0015 mm MLT 267°F UEL 10.5% LEL 1.7%	Strong oxidizers, water [Note: Converted to phthalic acid in hot water.]	Filter, NH ₄ OH HPLC/UVD, II(3) [#S179]

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin, resp sys.	Eye	Eyes, skin, resp sys
Eyes:	Prevent eye contact	10 mg/m ³ SA*	Ing	bron, derm	Skin	
Wash skin:	When contam	25 mg/m ³ SA CF*	Con		Breath	Water flush immed
Remove:	When wet or contam	50 mg/m ³ SCBAF/SAF			Swallow	Resp support Medical attention immed
Change:	Daily	70 mg/m ³ SAF:PD,PP				
Provide:	Eyewash, Quick drench	§ SCBAF PD PP/SAF PD PP ASCBA				
		Escape: GMFOVHE/SCBAE				
[Phosphorus pentachloride]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin, resp sys.	Eye	Eyes, skin, resp sys.
Eyes:	Prevent eye contact	10 mg/m ³ SA*	Ing	apnea, coma, convuls.	Skin	Dust off solid, water flush
Wash skin:	When contam	25 mg/m ³ SA CF*	Con	conj pain, lac, photo	Breath	Resp support
Remove:	When wet or contam	50 mg/m ³ SCBAF/SAF		kerato-conj, corn, vesic,	Swallow	Medical attention immed
Change:	Daily	250 mg/m ³ SAF:PD,PP		dizz, head fig, irity,		
		§ SCBAF PD PP/SAF PD PP ASCBA		insom, GI dist		
		Escape: GMFSHE/SCBAE				
[Phosphorus pentasulfide]						
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, skin, nose	Eye	Eyes, skin, resp sys
Eyes:	Prevent eye contact	10 ppm SCBAF/SAF	Ing	throat, pulm edema,	Skin	Water flush immed
Wash skin:	When contam	25 ppm: SAF:PD,PP	Con	eye, skin burns	Breath	Resp support
Remove:	When wet or contam	§ SCBAF PD PP/SAF PD,PP ASCBA			Swallow	Medical attention immed
Change:	N.R.	Escape: GMFSH/SCBAE				
Provide:	Eyewash, Quick drench					
[Phosphorus trichloride]						
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, skin, upper resp	Eye	Eyes, skin, resp sys.
Eyes:	Prevent eye contact	30 mg/m ³ DM*	Ing	eye, conj, nasal ulcer	Skin	Soap wash prompt
Wash skin:	When contam	60 mg/m ³ DMXSC/HIEF/PAPRDM*/	Con	bleeding, bron, bronchial	Breath	Resp support
Remove:	When wet or contam	SA*/SCBAF		asthma, derm,	Swallow	Medical attention immed
Change:	Daily	§ SCBAF PD PP/SAF PD,PP ASCBA		in animals: liver, kidney damage		
		Escape: HIEF/SCBAE				
[Phthalic anhydride]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
m-Phthalodinitrile $C_6H_4(CN)_2$ 626-17-5 CZ1900000	1,3-Benzenedicarbonitrile; m-Dicyanobenzene; 1,3-Dicyanobenzene; Isophthalodinitrile; m-PDN	NIOSH 5 mg/m ³ OSHA† none	N.D.	Needle-like, color- less to white, crystalline, flaky solid with an almond-like odor.	MW: 128.1 BP: Sublimes Sol: Slight FLP: ? IP: ?	VP: 0.01 mm MLT: 324°F (Sublimes) UEL: ? LEL: ?	Strong oxidizers (e.g., chlorine, bromine, fluorine)	None available
Sp.Gr: 4.42 Combustible Solid and a severe explosion hazard.								
Picloram $C_6H_4Cl_3O_2N_2$ 1918-02-1 TJ7525000	4-Amino-3,5,6-trichloro- picolinic acid; 4-Amino-3,5,6-trichloro- 2-picolinic acid; ATCP; Grazon®; Tordon®	NIOSH See Appendix D OSHA† 15 mg/m ³ (total) 5 mg/m ³ (resp)	N.D.	Colorless to white crystals with a chlorine-like odor. [herbicide]	MW: 241.5 BP: Decomposes Sol: 0.04% FLP: ? IP: ?	VP(95°F): 0.0000006 mm MLT: 424°F (Decomposes) UEL: ? LEL: ?	Hot concentrated alkali (hydrolyzes)	Filter; none; Grav; IR [Nuisance Dust: #500 (total), #600 (resp)]
Sp.Gr: ? Combustible Solid								
Picric acid $(NO_2)_3C_6H_2OH$ 88-89-1 TJ7875000	Phenol trinitrate; 2,4,6-Trinitrophenol [Note: An OSHA Class A Explosive (1910.109)]	NIOSH 0.1 mg/m ³ ST 0.3 mg/m ³ [skin] OSHA 0.1 mg/m ³ [skin]	75 mg/m ³	Yellow, odorless solid. [Note: Usually used as an aqueous solution.]	MW 229.1 BP: Explodes above 572°F Sol 1% FLP: 302°F IP: ?	VP(383°F): 1 mm MLT: 252°F UEL: ? LEL: ?	Copper, lead, zinc & other metals, salts, plaster, concrete, ammonia [Note: Corrosive to metals. An explosive mixture results when the aqueous solution crystallizes.]	Filter; Methanol/ Water; HPLC/UV; IR(4) [#5228]
Sp.Gr 1.76 Combustible Solid								
Pindone $C_{12}H_8O_4Cl_2$ 83-26-1 NK6300000	tert-Butyl valone; 1,3-Dioxo-2-pivaloyl-indane; Pival®; Pivalyl; 2-Pivalyl-1,3-indandione	NIOSH/OSHA 0.1 mg/m ³	100 mg/m ³	Bright-yellow powder with almost no odor [rodenticide]	MW 230.3 BP: Decomposes Sol(77°F): 0.002% FLP: ? IP: ?	VP: Very low MLT: 230°F UEL: ? LEL: ?	None reported	None available
Sp.Gr 1.06								

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)	
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact Daily When wet or contam Daily	TBAL	Inh Abs Ing Con	Head, nau, conf; in animals: irrit eyes, skin	Eye: Skin: Breath: Swallow:	Irritated Soap wash Resp support Medical attention Irritated	Eyes, skin, CNS
[m-Phthalodinitrile]							
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam N.R. Daily	TBAL	Inh Ing Con	Irrit eyes, skin, resp sys; nau; in animals: liver, kidney changes	Eye: Skin: Breath: Swallow:	Irritated Soap wash Fresh air Medical attention Irritated	Eyes, skin, resp sys, liver, kidneys
[Picloram]							
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam/Daily When wet or contam Daily	NIOSH/OSHA 0.5 mg/m ³ DM 1 mg/m ³ DMXSQ/SA 2.5 mg/m ³ SA CF/PAPRDM 5 mg/m ³ H ₂ EF/SAT CF/PAPRTH ₂ /SCBAF/SAF 75 mg/m ³ SAF/PD,PP § SCBAF PD,PP/SAF PD,PP ASCBA Escape: H ₂ EF/SCBAE	Inh Abs Ing Con	Irrit eyes, skin; sens derm, yellow-stained hair, skin, weak, myalgia, anuria, polyuria, bitter taste, GI dist, hepatitis, hema, album, neph	Eye Skin Breath Swallow	Irritated Soap wash prompt Resp support Medical attention Irritated	Eyes, skin, kidneys, liver, blood
[Picric acid]							
Skin: Eyes: Wash skin: Remove: Change:	N.R. N.R. N.R. N.R. Daily	NIOSH/OSHA 0.5 mg/m ³ DM 1 mg/m ³ DMXSQ/SA 2.5 mg/m ³ SA CF/PAPRDM 5 mg/m ³ H ₂ EF/SAT CF/PAPRTH ₂ /SCBAF/SAF 100 mg/m ³ SAF/PD,PP § SCBAF PD,PP/SAF PD,PP ASCBA Escape: H ₂ EF/SCBAE	Inh Ing	Epi., excess bleeding from minor cuts, bruises, smoky urine, black tarry stools, abdom, back pain	Eye Breath: Swallow	Irritated Resp support Medical attention Irritated	Blood prothrombin
[Picronic acid]							

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl, P, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Piperazine dihydro- chloride $C_4H_{10}N_2 \cdot 2HCl$ 142-64-3 TL 4026000	Piperazine hydrochloride [Note: The monochloride, $C_4H_{10}N_2 \cdot HCl$ is also commercially available.]	NIOSH 8 mg/m ³ OSHA† none	N.D.	White to cream- colored needles or powder.	MW: 159.1 BP: ? Sol: 41% Fl, P: ? IP: ?	VP: ? MLT: 635°F UEL: ? LEL: ?	Water [Note: Slightly hygroscopic (i.e., absorbs moisture from the air).]	None available
					Sp. Gr: ? Combustible Solid, but does not ignite easily.			
Plaster of Paris $CaSO_4 \cdot 0.5H_2O$ 25499-65-0 TP 0700000	Calcium sulfate hemihydrate, Dried calcium sulfate, Gypsum hemihydrate, Hemihydrate gypsum [Note: Plaster of Paris is the hemihydrate form of Calcium Sulfate & Gypsum is the dihydrate form.]	NIOSH 10 mg/m ³ (total) 5 mg/m ³ (resp) OSHA 15 mg/m ³ (total) 5 mg/m ³ (resp)	N.D.	White or yellowish, finely divided, odorless powder.	MW: 145.2 BP: ? Sol(77°F): 0.3% Fl, P: NA IP: NA	VP: 0 mm (approx) MLT: 325°F (Loose H_2O) UEL: NA LEL: NA	Moisture, water [Note: Hygroscopic (i.e., absorbs moisture from the air). Reacts with water to form Gypsum.]	Filter; none; Grav; III [Irritation Dust: #0500 (total), #0500 (resp)]
Platinum Pt 7440-06-4 TP 2160000	Platinum black, Platinum metal, Platinum sponge	NIOSH 1 mg/m ³ OSHA† none	N.D.	Silvery, whitish- gray, malleable, ductile metal.	MW: 195.1 BP: 6921°F Sol: Insoluble Fl, P: NA IP: NA	VP: 0 mm (approx) MLT: 3222°F UEL: NA LEL: NA	Aluminum, acetone, arsenic, ethane, hydrazine, hydrogen peroxide, lithium, phosphorus, selenium, tellurium, various fluorides	Filter; Acids; KCP; III [#7300, Sements]
					Sp. Gr: 21.45 Noncombustible Solid in bulk form, but finely divided powder can be dangerous to handle.			
Platinum (soluble salts, as Pt)	Synonyms vary depending upon the specific soluble platinum salt	NIOSH/OSHA 0.002 mg/m ³	4 mg/m ³ (as Pt)	Appearance and odor vary depending upon the specific soluble platinum salt	Properties vary depending upon the specific soluble platinum salt.		Varies	Filter Acid/ Reagent, AAS/GF; h47; [#S191]

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)	
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam Daily Eyewash, Quick drench	TBAL	Inh Abs Ing Con	Irrit eyes, skin, resp sys; skin burns, sens; asthma; GI upset, head, nau, vomit, Inco, muscle weak	Eye: Skin: Breath: Swallow:	Irrimmed Water flush immed Resp support Medical attention immed	Eyes, skin, resp sys, CNS
[Piperazine dihydrochloride]							
Skin: Eyes: Wash skin: Remove: Change:	N.R. N.R. N.R. N.R. N.R.	TBAL	Inh Ing Con	Irrit eyes, skin, muc memb, resp sys; cough	Eye: Breath: Swallow:	Irrimmed Resp support Medical attention immed	Eyes, skin, resp sys
[Plaster of Paris]							
Skin: Eyes: Wash skin: Remove: Change:	N.R. N.R. N.R. N.R. Daily	TBAL	Inh Ing Con	Irrit eyes, skin, resp sys; derm	Eye: Skin: Breath: Swallow:	Irrimmed Soap wash Resp support Medical attention immed	Eyes, skin, resp sys
[Platinum]							
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet or contam Daily	NIOSH/OSHA 0.05 mg/m ³ SA CF ¹ 0.1 mg/m ³ H/EF/SCBAF/SAF 4 mg/m ³ SAF PD PP § SCBAF PD PP/SAF PD,PP ASCBA Escape H/EF/SCBAE	Inh Ing Con	Irrit eyes, nose, cough, dysp, wheez, cyan derm, sens skin, lymphocytosis	Eye Skin Breath Swallow	Irrimmed Water flush immed Resp support Medical attention immed	Eyes, skin, resp sys

[Platinum (soluble salts: $\pm$ P)]

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide No.	Synonyms, trade names, and conversion factors	Exposure limits TWAs (unless noted otherwise)	IDLH	Physical description	Chemical and physical properties	Incompatibilities and reactivities	Measurement method (See Table 1)
Portland cement 65997-15-1 VV8770000	Cement Hydraulic cement, Portland cement, silicate [Note: A class of hydraulic cements containing tri- and dicalcium silicate in addition to alumina, tricalcium aluminate, and iron oxide.]	NIOSH 10 mg/m ³ (total) 5 mg/m ³ (resp.) OSHA† 15 mg/m ³ (total) 5 mg/m ³ (resp.)	5000 mg/m ³	Gray odorless powder	MW ? BP NA Sol Insoluble FIP NA IP NA Sp Gr ? Noncombustible Solid	VP 0 mm (approx) MLT NA UEL NA LEL NA Solid	None reported Filter none, Grav. III [#Q500 Nuisance Dust (total)]
Potassium cyanide (as CN) KCN 151-50-8 TS8750000 1680 55 (solution)	Potassium salt of hydrocyanic acid	NIOSH* C 5 mg/m ³ (4.7 ppm) (10-min) OSHA* 5 mg/m ³ [Note: The REL and PEL also apply to other cyanides (as CN) except Hydrogen cyanide.]	25 mg/m ³ (as CN)	White, granular or crystalline solid with a faint, almond-like odor.	MW 65.1 BP: 295°F Sol(77°F) 72% FIP NA IP NA Sp Gr 1.55 Noncombustible Solid, but contact with acids releases highly flammable hydrogen cyanide	VP 0 mm (approx) MLT 1173°F UEL NA LEL NA [Note: Absorbs moisture from the air forming a syrup.]	Filter/Bub. KOH, ISE, III [#7904 Cyanides] [Also #6010 Hydrogen Cyanide.]
Potassium hydroxide KOH 1310-58-3 TT2100000 1813 60 (dry, solid) 1814 60 (solution)	Caustic potash, Lye, Potassium hydrate	NIOSH 2 mg/m ³ OSHA† none	N.D.	Odorless, white or slightly yellow lumps, rods, flakes, sticks, or pellets. [Note: May be used as an aqueous solution.]	MW: 56.1 BP: 2415°F Sol(59°F): 107% FIP: NA IP: ? Sp. Gr: 2.04 Noncombustible Solid; however, may react with acids and generate sufficient heat to ignite combustible materials.	VP(131°F): 1 mm MLT: 718°F UEL: NA LEL: NA [Note: Heat is gener- ated if KOH comes in contact with H ₂ O & CO ₂ from the air.]	Filter; HCl; Titrate; III [#7401, Alkaline Dusts]
Propane CH ₃ CH ₂ CH ₃ 74-98-6 TX2275000	Bottled gas, Dimethyl methane, n-Propane Propyl hydros	NIOSH/OSHA 1000 ppm (1800 mg/m ³)	2100 ppm [LEL]	Colorless, odorless gas [Note: A foul- smelling odorant is often added when used for fuel purposes. Shipped as a liquefied com- pressed gas.]	MW 44.1 BP -44°F Sol 0.01% FIP NA (Gas) IP 11.07 av RQ GasD 1.55 Flamm.	VP(70°F): 8.4 atm FRZ -306°F UEL 9.5% LEL 2.1%	Strong oxidizers Combustible gas meter, none, III(2) [#S87]

† 1 ppm = 1 mg/m³

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection - maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 6)
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, skin, nose,	Eye	Eyes, skin, resp sys
Eyes:	Prevent eye contact	50 mg/m ³ D	Ing	cough, expectoration,	Skin	
Wash skin:	When contam	100 mg/m ³ DXSQ/SA	Con	exertional dysp, wheez,	Breath	
Remove:	When wet or contam	250 mg/m ³ SA CF/PAPRD		chronic bron, derm	Swallow	
Change:	N.R.	500 mg/m ³ HIEF/SAT CF/PAPRTHIE/ SCBAF/SAF				
[Portland cement]		5000 mg/m ³ SA PD PP § SCBAF PD PP/SAF PD PP ASCBA Escape HIEF/SCBAE				
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin, upper resp	Eye	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	25 mg/m ³ SA/SCBAF	Ads	sys: asphy, weak, head,	Skin	CVS, CNS, thyroid,
Wash skin:	When contam	§ SCBAF PD PP/SAF PD PP ASCBA	Ing	conf, nau, vomit, incr rate	Breath	blood
Remove:	When wet or contam	Escape GMFSHE/SCBAE	Con	resp, slow gasping resp,	Swallow	
Change:	Daily			thyroid, blood changes		
Provide:	Eyewash, Quick drench					
[Potassium cyanide (see CN)]						
Skin:	Prevent skin contact	TBAL	Inh	Irrit eyes, skin, resp sys;	Eye	Eyes, skin, resp sys
Eyes:	Prevent eye contact		Ing	cough, sneez; eye, skin	Skin:	
Wash skin:	When contam		Con	burns; vomit, diarr	Breath:	
Remove:	When wet or contam				Swallow:	
Change:	Daily					
Provide:	Eyewash, Quick drench					
[Potassium hydroxide]						
Skin:	Frostbite	NIOSH/OSHA	Inh	Dizz, conf, excitation,	Eye:	CNS
Eyes:	Frostbite	2100 ppm: SA/SCBAF	Con	asphy; liq; frostbite	Skin:	
Wash skin:	N.R.	§ SCBAF PD PP/SAF PD PP ASCBA	(liq)		Breath:	
Remove:	When wet (flam)	Escape SCBAE				
Change:	N.R.					
Provide:	Frostbite					
[Propane]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P, IP, Sp. Gr, flammability	VP, FRZ UEL, LEL		
Propane sulfone $C_3H_6O_2S$ 1120-71-4 RP5425000	3-Hydroxy-1-propanesul- phonic acid sulfone; 1,3-Propane sulfone	NIOSH Ca See Appendix A OSHA none	N.D.	White, crystalline solid or a colorless liquid (above 86°F). [Note: Releases a foul odor as it melts.]	MW: 122.2 BP: 7 Sol: 10% Fl.P: >235°F IP: 7 Sp. Gr: 1.38 Combustible Solid	VP: ? MLT: 88°F UEL: ? LEL: ?	None reported	None available
1-Propanethiol $CH_3CH_2CH_2SH$ 107-03-9 TZ7300000	3-Mercaptopropane, Propane-1-thiol, Propyl mercaptan, n-Propyl mercaptan	NIOSH C 0.5 ppm (1.6 mg/m ³) [15-min] OSHA none	N.D.	Colorless liquid with an offensive, cabbage-like odor.	MW: 76.2 BP: 153°F Sol: Slight Fl.P: -8°F IP: 9.196 eV Sp. Gr: 0.84 Class IB Flammable Liquid	VP(77°F): 155mm FRZ: -172°F UEL: ? LEL: ?	Oxidizers, reducing agents, strong acids & bases, alkali metals, calcium hypochlorite	None available
2402 27	1 ppm = 3.17 mg/m ³							
Propargyl alcohol $HC \equiv CCH_2OH$ 107-19-7 UK5075000	1-Propyn-3-ol; 2-Propyn-1-ol; 2-Propynyl alcohol	NIOSH 1 ppm (2 mg/m ³) [skin] OSHA† none	N.D.	Colorless to straw- colored liquid with a mild, geranium odor.	MW: 56.1 BP: 237°F Sol: Miscible Fl.P(jc): 97°F IP: 10.51 eV Sp. Gr: 0.97 Class IC Flammable Liquid	VP: 12 mm FRZ: -62°F UEL: ? LEL: ?	Phosphorus pentoxide, oxidizers	None available
1986 28	1 ppm = 2.33 mg/m ³							
β-Propiolactone $C_3H_4O_2$ 57-57-8 RQ7350000	BPL Hydroacrylic acid, β-lactone, 3-Hydroxy-β-lactone 3-Hydroxy-propionic acid, β-lactone, 2-Oxetanone, 3-Propiolactone	NIOSH Ca See Appendix A OSHA(1910.1013) See Appendix B	Ca [N.D.]	Colorless liquid with a slightly sweet odor	MW 72.1 BP 323°F (Decomposes) Sol 37% Fl.P 165°F IP ? Sp Gr 1.15 Class IIA Flammable Liquid	VP(77°F) 3mm FRZ -28°F UEL ? LEL 2.9%	Acetates, halogens, thiocyanates, thiosulfates [Note: May polymerize upon storage]	None available
	1 ppm = 3.00 mg/m ³							

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 6)	First aid (See Table 6)	Target organs (See Table 6)
Skin:	Prevent skin contact	NIOSH	Inh	In animals: Irrit eyes, skin, muc memb; [carc]	Eye:	Eye, skin, resp sys
Eyes:	Prevent eye contact	§ SCBAF:PD,PP/SAF:PD,PP:ASCBA	Abs		Skin:	[In animals: skin tumors, leukemia, gliomas]
Wash skin:	When contam/Daily	Escape: GMFOVHIE/SCBAE	Inh		Breath:	
Remove:	When wet or contam		Abs		Swallow:	
Change:	Daily		Inh			
Provide:	Eyewash, Quick drench		Abs			
[Propane sulfone]						
Skin:	N.R.	NIOSH	Inh	Irrit eyes, skin, nose, throat, resp sys; head, nau, dizz, cyan;	Eye:	Eye, skin, resp sys,
Eyes:	Prevent eye contact	8 ppm: CCROV/SA	Abs	In animals: liver, kidney damage	Skin:	CNS, blood, liver, kidneys
Wash skin:	N.R.	12.5 ppm: SA:CF/PAPROV	Inh		Breath:	
Remove:	When wet (flam)	25 ppm: CCRFOV/GMFOV/PAPRTOV/SCBAF/SAF	Abs		Swallow:	
Change:	N.R.	§ SCBAF:PD,PP/SAF:PD,PP:ASCBA	Inh			
Provide:	Eyewash	Escape: GMFOV/SCBAE	Abs			
[1-Propanethiol]						
Skin:	Prevent skin contact	TBAL	Inh	Irrit skin, muc memb; CNS depress;	Eye:	Skin, resp sys, CNS,
Eyes:	Prevent eye contact		Abs	In animals: liver, kidney damage	Skin:	liver, kidneys
Wash skin:	When contam		Inh		Breath:	
Remove:	When wet or contam		Abs		Swallow:	
Change:	N.R.		Inh			
Provide:	Eyewash, Quick drench		Abs			
[Propargyl alcohol]						
Skin:	Prevent skin contact	NIOSH	Inh	Skin irrit, blistering, burns, corn opac, frequent urination, dysuria, hema, [carc]	Eye:	Kidneys, skin, lungs, eyes
Eyes:	Prevent eye contact	§ SCBAF:PD,PP/SAF:PD,PP:ASCBA	Abs		Skin:	[In animals: tumors of the liver, skin & stomach]
Wash skin:	When contam/Daily	Escape: GMFOV/SCBAE	Inh		Breath:	
Remove:	When wet or contam		Abs		Swallow:	
Change:	Daily		Inh			
Provide:	Eyewash, Quick drench		Abs			
[6-Propiolactone]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL, FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Propionic acid <chem>CH3CH2COOH</chem> 79-09-4 UE5960000	Carboxystyrene, Ethylsuccinic acid, Ethylformic acid, Metacetic acid, Methyl acetic acid, Propanoic acid	NIOSH 10 ppm (30 mg/m ³) ST 15 ppm (45 mg/m ³) OSHA† none	N.D.	Colorless, oily liquid with a pungent, disagree- able, rancid odor. [Note: A solid below 5°F.]	MW: 74.1 BP: 204°F Sol: Miscible FLP: 126°F IP: 10.24 eV Sp. Gr: 0.99 Class II Combustible Liquid	VP: 3 mm FRZ: 5°F UEL: 12.1% LEL: 2.9%	Alkalies, strong oxidizers (e.g., chromium trioxide) [Note: Corrosive to steel.]	None available
1848 60	1 ppm = 3.08 mg/m ³							
Propionitrile <chem>CH3CH2CN</chem> 107-12-0 UF9428000	Cyanoethane, Ethyl cyanide, Propenenitrile, Propionic nitrile, Propiononitrile	NIOSH 6 ppm (14 mg/m ³) OSHA none	N.D.	Colorless liquid with a pleasant, sweetish, ethereal odor. [Note: Forms cyanide in the body.]	MW: 55.1 BP: 207°F Sol: 11.9% FLP: 36°F IP: 11.84 eV Sp. Gr: 0.78 Class IB Flammable Liquid	VP: 35 mm FRZ: -133°F UEL: 7% LEL: 3.1%	Strong oxidizers & reducing agents, strong acids & bases [Note: Hydrogen cyanide is produced when propionitrile is heated to decomposition.]	Char; Benzene; GCFID; II [Adapt §1506]
2404 28	1 ppm = 2.29 mg/m ³							
Proposur <chem>CH3NHCOOC2H5OCH(CH3)2</chem> 114-25-1 FC3150000	Aprocarbide, Beygon®, o-Isopropoxyphenyl- N-methylcarbamate, N-Methyl-2-isopropoxyphenyl- carbamate	NIOSH 0.5 mg/m ³ OSHA† none	N.D.	White to tan, crystalline powder with a faint, characteristic odor. [Insecticide]	MW: 209.3 BP: Decomposes Sol: 0.2% FLP: >300°F IP: ? Sp. Gr: ? Class IIB Combustible Liquid	VP: 0.000007 mm MLT: 197°F UEL: ? LEL: ?	Strong oxidizers, alkalis [Note: Emits highly toxic methyl isocyanate fumes when heated to decomposition.]	None available
n-Propyl acetate <chem>CH3COOCH2CH2CH3</chem> 109-60-4 AJ3675000	Propylacetate, n-Propyl ester of acetic acid	NIOSH 200 ppm (840 mg/m ³) ST 250 ppm (1050 mg/m ³) OSHA† 200 ppm (840 mg/m ³)	1700 ppm	Colorless liquid with a mild, fruity odor	MW: 102.2 BP: 215°F Sol: 2% FLP 55°F IP: 10.04 eV Sp. Gr: 0.84 Class IB Flammable Liquid	VP: 25 mm FRZ: -134°F UEL: 8% LEL: 1.7%	Nitrates, strong oxidizers, alkalis & acids	Char, CS, GCFID; II [§1450, Esters I]
1275 26	1 ppm = 4.25 mg/m ³							

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	Prevent skin contact	TBAL	Inh	Irrit eyes, skin, nose,	Eye:	Eyes, skin, resp sys
Eyes:	Prevent eye contact		Abs	throat; blurred vision;	Skin:	
Wash skin:	When contam		ing	com burns, skin burns;	Breath:	Water flush immed
Remove:	When wet or contam		Con	abdom pain, nau, vomit	Swallow:	Resp support Medical attention immed
Change:	N.R.					
Provide:	Eyewash, Quick drench					
[Propionic acid]						
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, skin, resp sys;	Eye:	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	60 ppm: CCROV/SA	Abs	nau, vomit; chest pain;	Skin:	CVS, CNS, liver,
Wash skin:	When contam	150 ppm: SA:CF/PAPROV	ing	weak; stupor, convuls;	Breath:	kidneys
Remove:	When wet or contam	300 ppm: CCROFOV/GMFOV/PAPRTOV/ SCBAF/SAF	Con	in animals: liver, kidney damage	Swallow:	Water flush immed Resp support Medical attention immed
Change:	N.R.	1000 ppm: SAF-PD, PP				
Provide:	Quick drench	5 SCBAF-PD, PP/SAF-PD, PP/ASCBA Escape: GMFOV/SCBAE				
[Propionitrile]						
Skin:	Prevent skin contact	TBAL	Inh	Miosis, blurred vision;	Eye:	CNS, liver, kidneys,
Eyes:	Prevent eye contact		Abs	sweat, saliv; abdom cramps,	Skin:	GI tract, blood chol
Wash skin:	Daily		ing	nau, diar, vomit; head,	Breath:	
Remove:	When wet or contam		Con	weak, muscle twitch	Swallow:	Water flush immed Resp support Medical attention immed
Change:	Daily					
[Proposul]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	In animals: irrit eyes,	Eye:	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	1700 ppm: SA:CF/CCROFOV/GMFOV/ PAPROV/SCBAF/SAF	ing	nose, throat, derm, narco	Skin:	CNS
Wash skin:	When contam	5 SCBAF-PD, PP/SAF-PD, PP/ASCBA Escape: GMFOV/SCBAE	Con		Breath:	
Remove:	When wet (flam)				Swallow:	Water flush prompt Resp support Medical attention immed
Change:	N.R.					
[n-Propyl acetate]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
n-Propyl alcohol <chem>CH3CH2CH2OH</chem> 71-23-8 UH8225000	Ethyl carbinol, 1-Propanol, n-Propanol, Propyl alcohol	NIOSH/OSHA 200 ppm (500 mg/m ³) ST 250 ppm (625 mg/m ³) [skin]	800 ppm	Colorless liquid with a mild, alcohol-like odor.	MW: 60.1 BP: 201°F Sol: Miscible FLP: 72°F IP: 10.15 eV	VP: 15 mm FRZ: -196°F UEL: 13.7% LEL: 2.2%	Strong oxidizers	Char; 2-Propanol/ CS, GC/ECID, II [#1401, Alcohols II]
1274 26	1 ppm = 2.50 mg/m ³	OSHA† 200 ppm (500 mg/m ³)			Sp Gr: 0.81 Class IB Flammable Liquid			
Propylene dichloride <chem>CH3CHClCH2Cl</chem> 78-67-5 TX9625000	Dichloro-1,2-propane, 1,2-Dichloropropane	NIOSH Ca See Appendix A OSHA† 75 ppm (350 mg/m ³)	Ca [400 ppm]	Colorless liquid with a chloroform- like odor [pesticide]	MW: 113.0 BP: 206°F Sol: 0.3% FLP: 60°F IP: 10.87 eV	VP: 40 mm FRZ: -149°F UEL: 14.5% LEL: 3.4%	Strong oxidizers, strong acids, active metals	Char(pet); Acetone/ Cyclo- hexane, GC/ECID, II [#1013, 1,2-Di- chloro- propane]
1279 27	1 ppm = 4.70 mg/m ³				Sp Gr: 1.16 Class IB Flammable Liquid			
Propylene glycol dinitrate <chem>CH3CH2OCH2CH2ONO2</chem> 6423-43-4 TY6300000	PGDN; Propylene glycol- 1,2-dinitrate; 1,2-Propylene glycol dinitrate	NIOSH 0.05 ppm (0.3 mg/m ³) [skin] OSHA† none	N.D.	Colorless liquid with a disagreeable odor. [Note: A solid below 18°F.]	MW: 166.1 BP: ? Sol: 0.1% FLP: ? IP: ?	VP(72°F): 0.07 mm FRZ: 18°F UEL: ? LEL: ?	Ammonia compounds, amines, oxidizers, reducing agents, combustible materials [Note: Similar to Ethylene glycol dinitrate in explosion potential.]	None available
1 ppm = 6.90 mg/m ³					Sp.Gr(77°F): 1.23 Combustible Liquid			
Propylene glycol monomethyl ether <chem>CH3OCH2CH2CH3</chem> 107-98-2 UB7700000	Dowtherm® 209, 1-Methoxy-2-hydroxypropane, 1-Methoxy-2-propanol, 2-Methoxy-1-methylethanol, Propylene glycol methyl ether	NIOSH 100 ppm (340 mg/m ³) ST 100 ppm (340 mg/m ³) OSHA† none	N.D.	Clear, colorless liquid with a mild, ethereal odor.	MW: 90.1 BP: 248°F Sol: Miscible FLP: 97°F IP: ?	VP(77°F): 12 mm FRZ: -139°F (Sets to glass) UEL(calc): 13.8% LEL(calc): 1.9%	Oxidizers, strong acids [Note: Hygroscopic (i.e. absorbs moisture from the air). May slowly form reactive peroxides during prolonged storage.]	None available
1 ppm = 3.75 mg/m ³					Sp.Gr: 0.96 Class IC Flammable Liquid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet (flam) N.R.	NIOSH 800 ppm: CCROV*/PAPROV*/GMFOV/ SA*/SCBAF § SCBAF PD PP/SAF PD PP ASCBA Escape GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, nose, throat, dry cracking skin, drow, head ataxia, GI pain, abdom cramps, nau, vomit, vomt, diarr; in animals: narco	Eye: Skin: Breath: Swallow: Irrimed Water flush Resp support Medical attention immed	Eyes, skin, resp sys, GI tract, CNS
[n-Propyl alcohol]						
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet (flam) N.R. Eyewash, Quick drench	NIOSH § SCBAF PD PP/SAF PD PP ASCBA Escape GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, skin, resp sys; drow, h-head, liver, kidney damage; in animals: CNS deprese; [carc]	Eye: Skin: Breath: Swallow: Irrimed Soap wash prompt Resp support Medical attention immed	Eyes, skin, resp sys, liver, kidneys, CNS [in animals: liver & mammary gland tumors]
[Propylene dichloride]						
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact N.R. N.R. N.R.	TBAL	Inh Abs Ing Con	Irrit eyes; conj; methemo; head; impaired balance, vis dist; in animals: liver, kidney damage	Eye: Skin: Breath: Swallow: Irrimed Soap wash Resp support Medical attention immed	Eyes, CNS, blood, liver, kidneys
[Propylene glycol dimethyl ether]						
Skin: Eyes: Wash skin: Remove: Change:	N.R. Prevent eye contact N.R. When wet (flam) N.R.	TBAL	Inh Abs Ing Con	Irrit eyes, skin, nose, throat; head, nau, h-head, drow, inco; vomit, diarr	Eye: Skin: Breath: Swallow: Irrimed Water wash Resp support Medical attention immed	Eyes, skin, resp sys, CNS
[Propylene glycol monomethyl ether]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TLWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, Flammability	VP, FRZ UEL, LEL		
Propylene imine C_3H_5N 75-55-8 CM8050000	2-Methylaziridine, 2-Methylethyleneimine, Propyleneimine, Propylene imine (inhibited) Propylenimine	NIOSH Ca See Appendix A 2 ppm (5 mg/m ³) [skin] OSHA 2 ppm (5 mg/m ³) [skin]	Ca [100 ppm]	Colorless, oily liquid with an ammonia-like odor.	MW 57.1 BP 152°F Sol: Miscible FLP 25°F IP 9.00 eV	VP 112 mm FRZ -85°F UEL ? LEL ?	Acids, strong oxidizers, water, carbonyl compounds, quinones, sulfonyl halides [Note: Subject to violent polymerization in contact with acids. Hydrolyzes in water to form methylethanolamine.]	None available
1921 30 (inhibited)	1 ppm = 2.37 mg/m ³				Sp Gr: 0.80 Class IB Flammable Liquid			
Propylene oxide C_3H_6O 75-56-9 TZ2975000	1,2-Epoxy propane; Methyl ethylene oxide; Methyloxirane; Propene oxide; 1,2-Propylene oxide	NIOSH Ca See Appendix A OSHA† 100 ppm (240 mg/m ³)	Ca [400 ppm]	Colorless liquid with a benzene- like odor. [Note: A gas above 94°F.]	MW 58.1 BP 94°F Sol: 41% FLP -35°F IP 9.81 eV	VP 445 mm FRZ -170°F UEL 36% LEL 2.3%	Anhydrous metal chlorides; iron; strong acids; caustics & peroxides [Note: Polymerization may occur due to high temperatures or contamination with alkalis, aqueous acids, amines & acidic alcohols.]	Char; CS; GC/FID; II [#1612]
1260 26	1 ppm = 2.42 mg/m ³				Sp Gr: 0.83 Class IA Flammable Liquid			
n-Propyl nitrate $CH_3CH_2CH_2ONO_2$ 627-13-4 UK0350000	Propyl ester of nitric acid	NIOSH 25 ppm (105 mg/m ³) ST 40 ppm (170 mg/m ³) OSHA† 25 ppm (110 mg/m ³)	500 ppm	Colorless to straw-colored liquid with an ether-like odor.	MW 105.1 BP 231°F Sol: Slight FLP 68°F IP 11.07 eV	VP 18 mm FRZ -148°F UEL 100% LEL 2%	Strong oxidizers; combustible materials [Note: Forms explosive mixtures with combustible materials.]	Char; CS; GC/FID; II(3) [#5227]
1865 30	1 ppm = 4.37 mg/m ³				Sp Gr: 1.07 Class IB Flammable Liquid			
Pyrethrum $C_{21}H_{30}O_6/C_{21}H_{30}O_7$ $C_{21}H_{30}O_6/C_{21}H_{30}O_7$ $C_{21}H_{30}O_6/C_{21}H_{30}O_7$ 8003-34-7 UR4200000	Cinerin I or II, Jasmolin I or II, Pyrethrin I or II, Pyrethrum I or II [Note: Pyrethrum is a variable mixture of Cinerin, Jasmolin, and Pyrethrin.]	NIOSH/OSHA 5 mg/m ³	5000 mg/m ³	Brown, viscous oil or solid [insecticide]	MW 316-374 BP ? Sol: Insoluble FLP 180-190°F IP ?	VP: Low MLT ? UEL ? LEL ?	Strong oxidizers	Filter; CH,CN, HP[C/UV/D, II [#5008]
					Sp Gr 1 (approx) Class IIIA Combustible Liquid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 6)	
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet (flamm) N.R. Eyewash, Quick drench	NIOSH § SCBAF PD,PP/SAF PD,PP:ASCBA Escape: GMFS/SCBAE	Inh Abs Ing Con	Eye, skin burns; [canc]	Eye: Skin: Breath: Swallow: Irr immed Water flush immed Resp support Medical attention immed	Eyes, skin [in animals: nasal tumors]	
[Propylene imine]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet (flamm) N.R. Quick drench	NIOSH § SCBAF PD,PP/SAF PD,PP:ASCBA Escape: GMFS/SCBAE	Inh Ing Con	Irrit eyes, skin, resp sys; blisters, burns, [canc]	Eye: Skin: Breath: Swallow: Irr immed Water flush immed Resp support Medical attention immed	Eyes, skin, resp sys [in animals: nasal tumors]	
[Propylene oxide]							
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet (flamm) N.R.	NIOSH/OSHA 250 ppm: SA 500 ppm: SA:CF/SCBAF/SAF § SCBAF PD,PP/SAF PD,PP:ASCBA Escape: GMFS/SCBAE	Inh Ing Con	In animals: irrit eyes, skin, methemo, anoxia, cyan, dysp, weak, dizz, head	Eye: Skin: Breath: Swallow: Irr immed Soap wash prompt Resp support Medical attention immed	Eyes, skin, blood	
[n-Propyl nitrate]							
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet or contam Daily	NIOSH/OSHA 50 mg/m ³ : CCROVDMFu*SA* 125 mg/m ³ : SA:CF/PAPROVDMFu* 250 mg/m ³ : CCROVHIE/PAPRTOVHIE* SCBAF/SAF 5000 mg/m ³ : SAF PD,PP § SCBAF PD,PP/SAF PD,PP:ASCBA Escape: GMFOVHIE/SCBAE	Inh Ing Con	Erythema, derm, papules, pruritus, rhin, sneez; asthma	Eye: Skin: Breath: Swallow: Irr immed Soap wash immed Resp support Medical attention immed	Resp sys, skin, CNS	
[Pyrethrum]							

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Pyridine C_5H_5N 110-86-1 UR8400000	Azabenzene, Azine	NIOSH/OSHA 5 ppm (15 mg/m ³)	1000 ppm	Colorless to yellow liquid with a nauseating fish-like odor	MW 79.1 BP 240°F Sol: Miscible FLP 68°F IP: 9.27 eV	VP: 16 mm FRZ: -44°F UEL 12.4% LEL 1.8%	Strong oxidizers, strong acids	Char, CH ₂ Cl, GC/FID, IR [#1613]
1282-26	1 ppm = 3.29 mg/m ³				Sp Gr: 0.98 Class IB Flammable Liquid			
Quinone C_6H_4O 106-51-4 DK2625000	1,4-Benzquinone, p-Benzoquinone, 1,4-Cyclohexadiene dioxide, p-Quinone	NIOSH/OSHA 0.4 mg/m ³ (0.1 ppm)	100 mg/m ³	Pale-yellow solid with an acrid, chlorine-like odor.	MW 108.1 BP Sublimes Sol: Slight FLP 100-200°F IP: 9.68 eV	VP(77°F): 0.1 mm MLT: 240°F UEL ? LEL ?	Strong oxidizers	XAD-2 Ethanol/ Hexane HPLC/UV/D, IR(4) [#5181]
2587-55	1 ppm = 4.49 mg/m ³				Sp Gr: 1.32 Combustible Solid			
Resorcinol $C_6H_4(OH)_2$ 108-46-3 VG9625000	1,3-Benzenediol; m-Benzenediol; 1,3-Dihydroxybenzene; m-Dihydroxybenzene; 3-Hydroxyphenol; m-Hydroxyphenol	NIOSH 10 ppm (48 mg/m ³) ST 20 ppm (90 mg/m ³) OSHA† none	N.D.	White needles, plates, crystals, flakes, or powder with a faint odor. [Note: Turns pink on exposure to air or light, or contact with iron.]	MW: 110.1 BP: 531°F Sol: 110% FLP: 261°F IP: 8.63 eV Sp.Gr: 1.27 Class IIIB Combustible Liquid, but may be difficult to ignite.	VP(77°F): 0.0002 mm MLT: 228°F UEL: ? LEL: (392°F): 1.4%	Acetanilide, albumin, alkalis, and pyridine, camphor, ferric salts, menthol, spirit nitrous ether, strong oxidizers & bases [Note: Hygroscopic (i.e., absorbs moisture from the air).]	None available
2876-55	1 ppm = 4.58 mg/m ³							
Rhodium (metal fume and insoluble compounds, as Rh) Rh (Metal) 7440-16-6 (Metal) V19355000 (Metal)	Rhodium metal Elemental rhodium Synonyms of other insoluble rhodium compounds vary depending upon the specific compound	NIOSH/OSHA 0.1 mg/m ³	100 mg/m ³ (as Rh)	Metal: White, hard, ductile, malleable solid with a bluish-gray luster	MW 102.9 BP 5741°F Sol: insoluble FLP: NA IP: NA	VP: 0 mm (approx) MLT 3571°F UEL: NA LEL: NA	None reported for rhodium metal	Filter, Acid, AAS, IC(3) [#S188]
					Sp Gr: 12.41 (Metal) Metal: Noncombustible solid, but flammable as dust or emulsion			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection → maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 6)	First aid (See Table 6)	Target organs (See Table 6)
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flam) N.R. Change: N.R. Provide: Eyewash, Quick drench		NIOSH/OSHA 125 ppm: SA CF/PAPROV 250 ppm: CCRFOV/GMFOV/PAPRTOV/ SCBAF/SAF 1000 ppm: SAF/PD,PP § SCBAF PD PP/SAF PD,PP ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, head, ner, dizz, insom; nau and/or derm; liver, kidney damage	Eye: Skin Breath: Swallow Immersed Water flush Resp support Medical attention Immed	Eyes, skin, CNS, liver, kidneys, GI tract
[Pyridine]						
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily Provide: Eyewash, Quick drench		NIOSH/OSHA 10 mg/m ³ : SA CF 20 mg/m ³ : SCBAF/SAF 100 mg/m ³ : SAF/PD,PP § SCBAF PD PP/SAF PD,PP ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Eye irrit, conj, kerat, skin irrit	Eye: Skin Breath: Swallow Immersed Soap wash Resp support Medical attention Immed	Eyes, skin
[Quinone]						
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily Provide: Eyewash		TBAL	Inh Ing Con	Irrit eyes, skin, nose, throat, upper resp sys; methem, cyan, convuls; restles, bluish skin, incr heart rate, dysp; dizz, drow, hypothermia, hemog; spleen, kidney, liver changes; derm	Eye: Skin Breath: Swallow Immersed Water wash Resp support Medical attention Immed	Eyes, skin, resp sys, CVS, CNS, blood, spleen, liver, kidneys
[Resorcinol]						
Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.		NIOSH/OSHA 0.5 mg/m ³ : DM ^a 1 mg/m ³ : DMXQ ^a /SA 2.5 mg/m ³ : SA CF/PAPROV 5 mg/m ³ : HEF/SAF CF/PAPRTHE/ SCBAF/SAF 100 mg/m ³ : SA PD,PP § SCBAF PD PP/SAF PD,PP ASCBA Escape: HEF/SCBAE	Inh	Possible resp sens	Breath: Swallow Resp support Medical attention Immed	Resp sys

[Rhodium (metal fume and compounds as Rh)]

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P, IP, Sp, Gr, Flammability	VP, FRZ UEL, LEL		
Rhodium (soluble compounds, as Rh)	Synonyms vary depending upon the specific soluble rhodium compound	NIOSH/OSHA 0.001 mg/m ³	2 mg/m ³ (as Rh)	Appearance and odor vary depending upon the specific soluble rhodium compound	Properties vary depending upon the specific soluble rhodium compound.		Varies	Filter, Acid AAS/GF; II(3) [#S189]
Ronnel (CH ₃ O) ₂ P(S)OC ₂ H ₄ Cl ₂ 299-84-3 TG0525000	O,O-Dimethyl O-(2,4,5-tri- chlorophenyl) phosphor- thioate Fenchlorophos	NIOSH 10 mg/m ³ OSHA† 15 mg/m ³	300 mg/m ³	White to light tan crystalline solid [insecticide] [Note: A liquid above 106°F]	MW 321.6 BP Decomposes Sol(77°F) Fl.P. NA IP ? Sp Gr 1.49 Noncombustible Solid	VP(77°F) 0.0008 mm MLT 106°F UEL NA LEL NA	Strong oxidizers	Filter/ Chrom-102, Toluene, GC/FPD, III [#S299]
Rosin core solder, pyrolysis products (as formaldehyde)	Rosin flux pyrolysis products, Rosin core soldering flux pyrolysis products	NIOSH* 0.1 mg/m ³ [†Note: "Ca" in the presence of formaldehyde, acetaldehyde, or malonaldehyde. See Appendices A & C (Aldehydes).] OSHA† none	N.D.	Pyrolysis products of rosin core solder include acetone, aliphatic aldehydes, methyl alcohol, methane, ethane, various aromatic acids (the major components of rosin), CO & CO ₂	Properties vary depending upon the specific rosin core solder being used.		Varies	Filter/ Imp(2); none; Via; III [#3500, Formalde- hyde]
Rotoneone C ₁₂ H ₁₂ O ₂ 83-79-4 DJ2800000	1,2,12,12a-Tetrahydro-8,9- dimethoxy-2-[1-methyl- ethenyl]-[1]benzopyranol [3,4-b]furo[2,3-h][1] benzopyran-6(5aH)-one	NIOSH/OSHA 5 mg/m ³	2500 mg/m ³	Colorless to red, odorless, crystalline solid [insecticide]	MW 394.4 BP Decomposes Sol Insoluble Fl.P. ? IP ? Sp Gr 1.27 Combustible Solid	VP <0.00004 mm MLT 330°F UEL ? LEL ?	Strong oxidizers, alkalis	Filter, CH ₃ CN HPLC/UV, III [#5007]

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)		Target organs (See Table 5)
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R.	NIOSH/OSHA 0.010 mg/m ³ HE/TA* 0.025 mg/m ³ SA CF/PAPRHE* 0.050 mg/m ³ HEF/PAPRHE* SCBAF/SAF 2 mg/m ³ SAF PD,PP § SCBAF PD,PP/SAF PD,PP ASCBA Escape: HEF/SCBAE	Inh Ing Con	In animals: irrit eyes, CNS damage	Eye: Skin: Breath: Swallow:	Immed Water flush Resp support Medical attention immed	Eyes, CNS
[Rhodium (soluble compounds, as Rh)]							
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet or contam Daily	NIOSH 100 mg/m ³ CCROVDMFw/SA 250 mg/m ³ SA CF/PAPROVDMFu 300 mg/m ³ CCRFOVHIE/GMFOVHIE/ PAPRTOVHIE/SCBAF/SAF § SCBAF PD,PP/SAF PD,PP ASCBA Escape: GMFOVHIE/SCBAE	Inh Ing Con	In animals: irrit eyes, chol inhibition, liver, kidney damage	Eye: Skin: Breath: Swallow:	Immed Soap wash prompt Resp support Medical attention immed	Eyes, liver, kidneys, blood plasma
[Ronnell]							
Skin: Eyes: Wash skin: Remove: Change:	N.R. N.R. N.R. N.R. N.R.	TBAL In presence of Formaldehyde, Acetaldehyde, or Malonaldehyde: NIOSH § SCBAF PD,PP/SAF PD,PP ASCBA Escape: GMFOVHIE/SCBAE	Inh	Irrit eyes, nose, throat, upper resp sys	Eye: Breath:	Immed Resp support	Eyes, resp sys [nasal cancer; thyroid gland tumors in animals (in presence of Formaldehyde, Acetaldehyde, or Malonaldehyde)]
[Rosin core solder, pyrolysis products (as formaldehyde)]							
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet or contam Daily	NIOSH/OSHA 5 mg/m ³ CCROVDMFw/SA 125 mg/m ³ SA CF/PAPROVDMFu 250 mg/m ³ CCRFOVHIE/GMFOVHIE/ PAPRTOVHIE/SAT CF/ SCBAF/SAF 2500 mg/m ³ SA PD,PP § SCBAF PD,PP/SAF PD,PP ASCBA Escape: GMFOVHIE/SCBAE	Inh Ing Con	Irrit eyes, skin, resp sys; numb muc memb, nau, vomit, abdom pain; musc tremor, inco, clonic convuls, stupor	Eye: Skin: Breath: Swallow:	Immed Soap wash prompt Resp support Medical attention immed	Eyes, skin, resp sys, CNS
[Rotenone]							

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Rouge Fe_2O_3 1309-37-1 NO7400000	Iron(III)oxide, Iron oxide red, Red iron oxide, Red oxide	NIOSH See Appendix D OSHA† 15 mg/m ³ (total) 5 mg/m ³ (resp)	N.D.	A fine, red powder of ferric oxide. [Note: Usually used in cake form or impregnated in paper or cloth.]	MW: 159.7 BP: 7 Sol: Insoluble Fl.P: NA IP: NA Sp.Gr: 5.24 Noncombustible Solid	VP: 0 mm (approx) MLT: 2849°F UEL: NA LEL: NA	Calcium hypochlorite, carbon monoxide, hydrogen peroxide	Filter; none; Grav; II [Absence Dust: #0500 (total), #0600 (resp)]
Selenium Se 7782-49-2 VS7700000	Elemental selenium, Selenium alloy	NIOSH*†OSHA* 0.2 mg/m ³ [†Note: The REL and PEL also apply to other selenium compounds (as Se) except Selenium hexafluoride.]	1 mg/m ³ (as Se)	Amorphous or crystalline red to gray solid [Note: Occurs as an impurity in most sulfide ores.]	MW: 79.0 BP: 1265°F Sol: Insoluble Fl.P: NA IP: NA Sp.Gr: 4.28 Combustible Solid	VP: 0 mm (approx) MLT: 392°F UEL: NA LEL: NA	Acids: strong oxidizers: chromium trioxide, potassium bromate, cadmium	Filter; Acid; AAS, II(?) [§S190]
2658 53 (powder)								
Selenium hexafluoride (as Se) SeF_6 7783-79-1 VS9450000	Selenium fluoride	NIOSH 0.05 ppm (0.16 mg/m ³) OSHA 0.05 ppm (0.4 mg/m ³)	2 ppm	Colorless gas	MW: 193.0 BP: -30°F Sol: Insoluble Fl.P: NA IP: ? RGasD: 6.66 Nonflammable Gas	VP: >1 atm FRZ: -59°F UEL: NA LEL: NA	Water [Note: Hydrolyzes very slowly in cold water.]	None available
2194 15	1 ppm = 3.28 mg/m ³ (as Se)							
Silica, amorphous SiO_2 7631-86-9 VV7310000	Diatomaceous earth, Diatomaceous silica, Diatomite Precipitated amorphous silica, Silica gel, Silicon dioxide (amorphous)	NIOSH 6 mg/m ³ OSHA† See Appendix C (Mineral Dusts)	3000 mg/m ³	Transparent to gray odorless powder [Note: Amorphous silica is the non-crystalline form of SiO_2 .]	MW: 60.1 BP: 4046°F Sol: Insoluble Fl.P: NA IP: NA Sp.Gr: 2.20 Noncombustible Solid	VP: 0 mm (approx) MLT: 3110°F UEL: NA LEL: NA	Fluorine, oxygen difluoride, chlorine trifluoride	Filter, LTA, XRD, II [§7501]

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	N.R.	TBAL	Inh	Irritates eyes, skin, resp sys	Eye:	Eyes, skin, resp sys
Eyes:	N.R.		Con		Breath:	
Wash skin:	N.R.				Immersed	
Remove:	N.R.				Fresh air	
Change:	N.R.					
[Rouge]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irritates eyes, skin, nose	Eye	Eyes, skin, resp sys,
Eyes:	N.R.	1 mg/m ³ DM ⁺ /DMF ⁺ /HIEF/PAPRDM ⁺⁺	Inh	throat, vs. dist. head	Skin	liver, kidneys,
Wash skin:	When contam.	PAPRDMF ⁺ /SA ⁺ /SCBAF	Inh	chills, fever, dysp, bron,	Breath	blood, spleen
Remove:	When wet or contam.	§ SCBAF PD PP/SAF PD PP ASCBA	Con	metallic taste, garlic	Swallow	
Change:	N.R.	Escape HIEF/SCBAE		breath. GI dist, derm, eye,	Immersed	
Provide:	Quick drench			skin burns		
[Selenium]						
Skin:	N.R.	NIOSH/OSHA	Inh	In animals: pulm. ent,	Breath	Resp sys
Eyes:	N.R.	0.5 ppm SA		edema	Resp support	
Wash skin:	N.R.	1.25 ppm SA CF				
Remove:	N.R.	2 ppm SAT:CF/SCBAF/SAF				
Change:	N.R.	§ SCBAF PD PP/SAF PD PP ASCBA				
		Escape GMPS/SCBAE				
[Selenium hexafluoride (as Se)]						
Skin:	N.R.	NIOSH	Inh	Irritates eyes, pneumoconiosis	Eye	Eyes, resp sys
Eyes:	N.R.	30 mg/m ³ DM	Con		Breath:	
Wash skin:	N.R.	60 mg/m ³ DMXSO/SA			Immersed	
Remove:	N.R.	150 mg/m ³ SA CF/PAPRDM			Fresh air	
Change:	N.R.	300 mg/m ³ HIEF/SAT CF/PAPRTHIE/SCBAF/SAF				
		3000 mg/m ³ SA PD PP				
		§ SCBAF PD PP/SAF PD PP ASCBA				
		Escape HIEF/SCBAE				

(Selenium hexafluoride)

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL F.P., IP, Sp. Gr., flammability	VP, FRZ UEL, LEL		
Silica, crystalline (as respirable dust) SiO ₂ 14808-60-7 VV7330000	Cristobalite, Fused silica, Quartz, Tridymite, Tripoli	NIOSH Ca See Appendix A 0.05 mg/m ³ OSHA† See Appendix C (Mineral Dusts)	Ca [*] *IDLHs: 25 mg/m ³ (quartz, tripoli) 50 mg/m ³ (cristobalite, tridymite) N.D. (fused)	Colorless, odorless solid [Note: A component of many mineral dusts.]	MW: 60.1 BP: 4048°F Sol: Insoluble F.P.: NA IP: NA Sp. Gr: 2.66 Noncombustible Solid	VP: 0 mm (approx) MLT: 3110°F UEL: NA LEL: NA	Powerful oxidizers: fluorine, chlorine, trifluoride, manganese trioxide, oxygen difluoride, hydrogen peroxide, etc.; acetylene, ammonia	Filter; LTA; XRD; II [#7500]
Silicon Si 7440-21-3 VW0400000	Elemental silicon [Note: Does not occur free in nature, but is found in silicon dioxide (silica) & in various silicates.]	NIOSH 10 mg/m ³ (total) 5 mg/m ³ (resp) OSHA† 15 mg/m ³ (total) 5 mg/m ³ (resp)	N.D.	Black to gray, lustrous, needle- like crystals. [Note: The amorphous form is a dark-brown powder.]	MW: 28.1 BP: 4271°F Sol: Insoluble F.P.: NA IP: NA Sp. Gr: 2.33 Combustible Solid in powder form.	VP: 0 mm (approx) MLT: 2570°F UEL: NA LEL: NA MEC: 160 g/m ³	Chlorine, fluorine, oxidizers, calcium, cesium carbide, alkaline carbonates	Filter; none; Grav; II [Nuisance Dust: #0500 (total), #0600 (resp)]
Silicon carbide SiC 409-21-2 VW0450000	Carbon silicide, Carborundum®, Silicon monocarbide	NIOSH 10 mg/m ³ (total) 5 mg/m ³ (resp) OSHA† 15 mg/m ³ (total) 5 mg/m ³ (resp)	N.D.	Yellow to green to bluish-black, iridescent crystals.	MW: 40.1 BP: Sublimes Sol: Insoluble F.P.: NA IP: 9.30 eV Sp. Gr: 3.23 Noncombustible Solid	VP: 0 mm (approx) MLT: 4892°F (Sublimes) UEL: NA LEL: NA	None reported [Note: Sublimes with decomposition at 4892°F.]	Filter; none; Grav; II [Nuisance Dust: #0500 (total), #0600 (resp)]
Silicon tetrahydride SiH ₄ 7803-62-5 VV1400000	Monosilane, Silane, Silicane	NIOSH 5 ppm (7 mg/m ³) OSHA† none	N.D.	Colorless gas with a repulsive odor.	MW: 32.1 BP: -168°F Sol: Decomposes F.P.: NA (Gas) IP: ?	VP: >1 atm FRZ: -301°F UEL: ? LEL: ?	Halogens (bromine, chlorine, carbonyl chloride, antimony pentachloride, tin(IV) chloride), water	None available

Personal protection and sanitation (See Table 3)	Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
		Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.	NIOSH 0.5 mg/m ³ HIE 1.25 mg/m ³ PAPR/HIE/SA/CF 2.5 mg/m ³ HIE/PAPR/HIE 25 mg/m ³ SA/PO/PP 5 SCBA/PO/PP/SAF/PO/PP/ASCBA Escape:HIE/SCBAE	Inh Con	Cough, dysp, wheez, decr pulm func, progressive resp symptoms (silicosis); Irrit eyes; [canc]	Eye: Breath: Irrigated Fresh air	Eyes, resp sys [in animals: lung cancer]

[Silica, crystalline (as respirable dust)]

Skin: N.R. Eyes: Prevent eye contact Wash skin: N.R. Remove: N.R. Change: N.R.	TBAL	Inh Ing Con	Irrit eyes, skin, upper resp sys; cough	Eye: Breath: Swallow: Irrigated Fresh air Medical attention Irrigated	Eyes, skin, resp sys
--	------	-------------------	--	---	----------------------

[Silicon]

Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.	TBAL	Inh Ing Con	Irrit eyes, skin, upper resp sys; cough	Eye: Breath: Swallow: Irrigated Fresh air Medical attention Irrigated	Eyes, skin, resp sys
---	------	-------------------	--	---	----------------------

[Silicon carbide]

Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.	TBAL	Inh	Irrit eyes, skin, muc memb; nau, head	Breath: Resp support	Eyes, skin, resp sys, CNS
---	------	-----	--	-------------------------	------------------------------

[Silicon tetrahydride]

Chemical name, structure/formula, CAS and RTECS Nos., and DOTID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl, P, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Silver (metal dust and soluble compounds, as Ag) Ag (Metal) 7440-22-4 (Metal) VV3500000 (Metal)	Silver metal: Argentum Synonyms of soluble silver compounds such as Silver nitrate (AgNO ₃) vary depending upon the specific compound.	NIOSH/OSHA 0.01 mg/m ³	10 mg/m ³ (as Ag)	Metal. White, lustrous solid.	MW: 107.9 BP: 3632°F Sol: Insoluble Fl: P: NA IP: NA	VP: 0 mm (approx) MLT: 1761°F UEL: NA LEL: NA	Acetylene, ammonia, hydrogen peroxide, bromazide, chlorine trifluoride, ethylenimine, oxalic acid, tartaric acid	Filter; Acid; ICP; II [§7300 Elements]
					Sp Gr: 10.49 (Metal) Metal: Noncombustible Solid, but flammable in form of dust or powder.			
Soapstone (containing less than 1% quartz) 3MgO-4SiO ₂ -H ₂ O VV8780000	Massive talc, Soapstone silicate, Steatite	NIOSH 6 mg/m ³ (total) 3 mg/m ³ (resp) OSHA† 20 mppcf	3000 mg/m ³	Odorless, white-gray powder	MW: 379.3 BP: ? Sol: Insoluble Fl: P: NA IP: NA	VP: 0 mm (approx) MLT: ? UEL: NA LEL: NA	None reported	Filter, none; Grav; II [§0500, Nuisance Dust (total)]
					Sp Gr: 2.7-2.8 Noncombustible Solid			
Sodium aluminum fluoride (as F) Na ₃ AlF ₆ 15096-52-3 WA9625000	Cryolite, Cryodust, Cryolite, Sodium hexafluoroaluminate	NIOSH/OSHA* 2.5 mg/m ³ [*Note: The REL and PEL also apply to other inorganic, solid fluorides (as F).]	250 mg/m ³ (as F)	Colorless to dark, odorless solid. [pesticide] [Note: Loses color on heating.]	MW: 209.9 BP: Decomposes Sol: 0.04% Fl: P: NA IP: NA	VP: 0 mm (approx) MLT: 1832°F UEL: NA LEL: NA	Strong oxidizers	Fed/pre-Filter; Reagents; ISE; II [§7802, Fluorides]
					Sp Gr: 2.90 Noncombustible Solid			
Sodium azide NaN ₃ 28628-22-8 VY8050000	Azide, Azium, Sodium salt of hydrazoic acid	NIOSH 0.1 ppm (as HN ₃) (skin) 0.3 mg/m ³ (as NaN ₃) (skin) OSHA	N.D.	Colorless to white, odorless, crystalline solid. [pesticide] [Note: Forms hydrazoic acid (HN ₃) in water.]	MW: 85.0 BP: Decomposes Sol: (63°F): 42% Fl: P: ? IP: 11.70 eV	VP: ? MLT: 827°F (Decomposes) UEL: ? LEL: ?	Acids, metals, water [Note: Over a period of time, sodium azide may react with copper, lead, brass, or solder in plumbing systems to form an accumulation of the HIGHLY EXPLOSIVE compounds of lead, tin, and copper azide.]	None available

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Blue-gray eyes, nasal	Eye	Nasal septum,
Eyes:	Prevent eye contact	0.25 mg/m ³ SA CF*/PAPRHE*	Ing	septum, throat, skin,	Skin	skin, eyes
Wash skin:	When contam	0.5 mg/m ³ HIEF/SCBAF/SAF	Con	irrit, ulceration skin,	Breath:	
Remove:	When wet or contam (AgNO ₃)	10 mg/m ³ SAF/PD,PP		GI dist	Swallow:	
Change:	Daily	§ SCBAF PD,PP/SAF PD,PP/ASCBA				
Provide:	Eyewash	Escape: HIEF/SCBAE				
[Silver (metal dust and soluble compounds, as Ag)]						
Skin:	N.R.	NIOSH	Inh	Pneumoconiosis: cough,	Eye	Resp sys, CVS
Eyes:	N.R.	30 mg/m ³ DM	Con	dysp; digital clubbing;	Breath:	Resp support
Wash skin:	N.R.	60 mg/m ³ DMXSQ/SA		cyan; basal crackles,		
Remove:	N.R.	150 mg/m ³ PAPRDM		cor pulmonale		
Change:	N.R.	300 mg/m ³ HIEF/SAF/CF*/PAPRTHIE*/SCBAF/SAF				
		3000 mg/m ³ SAF PD,PP				
		§ SCBAF PD,PP/SAF PD,PP/ASCBA				
		Escape: HIEF/SCBAE				
[Soapstone (containing less than 1% quartz)]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, resp sys;	Eye	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	12.5 mg/m ³ DM	Ing	nausea, abdom pain, diarr;	Skin	CNS, skeleton,
Wash skin:	When contam	25 mg/m ³ DMXSQ/SA*	Con	saliv, thirst, sweet;	Breath:	kidneys
Remove:	When wet or contam	62.5 mg/m ³ SA CF*/PAPRDM*		stiff spine, dermat;	Swallow:	
Change:	Daily	125 mg/m ³ HIEF+/SCBAF/SAF		calcification of		
		250 mg/m ³ SAF/PD,PP		ligaments of ribs, pelvis		
		§ SCBAF PD,PP/SAF PD,PP/ASCBA				
		Escape: HIEF+/SCBAE				
[Sodium aluminum fluoride (as F)]		*Note: May need acid gas sorbent				
Skin:	Prevent skin contact	TBAI	Inh	Irrit eyes, skin; head,	Eye	Eyes, skin, CNS,
Eyes:	Prevent eye contact		Abs	dizziness, weakness, blurred vision;	Skin	CVS, kidneys
Wash skin:	When contam		Ing	dysp; low BP, bradycardia;	Breath:	
Remove:	When wet or contam		Con	kidney changes	Swallow:	
Change:	Daily					
Provide:	Eyewash, Quick drench					

[Sodium azide]

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Sodium bisulfite <chem>NaHSO3</chem> 7631-90-5 VZ2000000	Monosodium salt of sulfurous acid, Sodium acid bisulfite, Sodium bisulphite, Sodium hydrogen sulfite	NIOSH 5 mg/m ³ OSHA† none	N.D.	White crystals or powder with a slight odor of sulfur dioxide.	MW: 104.1 BP: Decomposes Sol: 29% FLP: NA IP: NA	VP: 7 MLT: Decomposes UEL: NA LEL: NA	Heat (decomposes) [Note: Slowly oxidized to the sulfate on exposure to air.]	Filter: none; Grav; IR #0500, Nuisance Dust (total)]
2693 60 (solution)					Sp, Gr: 1.48 Noncombustible Solid			
Sodium cyanide (as CN) <chem>NaCN</chem> 143-33-9 VZ7530000	Sodium salt of hydrocyanic acid	NIOSH* C 5 mg/m ³ (4.7 ppm) [10-min] OSHA* 5 mg/m ³ [*Note: The REL and PEL also apply to other cyanides (as CN) except Hydrogen cyanide.]	25 mg/m ³ (as CN)	White, granular or crystalline, solid with a faint, almond-like odor.	MW: 49.0 BP: 2725°F Sol: 77°F: 58% FLP: NA IP: NA	VP: 0 mm (approx) MLT: 1047°F UEL: NA LEL: NA	Strong oxidizers (such as acids, acid salts, chlorates & nitrates) [Note: Absorbs moisture from the air forming a syrup.]	Filter/Bub, KOH, ISE, IR #7904, Cyanides; [Also #6010, Hydrogen Cyanide.]
1689 55					Sp, Gr: 1.60 Noncombustible Solid, but contact with acids releases highly flammable hydrogen cyanide			
Sodium fluoride (as F) <chem>NaF</chem> 7681-49-4 WB0350000	Fluorine, Sodium monofluoride	NIOSH/OSHA 2.5 mg/m ³ [*Note: The REL and PEL also apply to other inorganic, solid fluorides (as F).]	250 mg/m ³ (as F)	Odorless, white powder or colorless crystals [pesticide] [Note: Pesticide grade is often dyed blue.]	MW: 42.0 BP: 3099°F Sol: 4% FLP: NA IP: NA	VP: 0 mm (approx) MLT: 1819°F UEL: NA LEL: NA	Strong oxidizers	Pad/pre- Filter; Reagents; ISE, IR #7902, Fluorides]
1690 54					Sp, Gr: 2.78 Noncombustible Solid			
Sodium fluoroacetate <chem>FCH2COONa</chem> 62-74-8 AH9100000	SFA, Sodium monofluoroacetate	NIOSH 0.05 mg/m ³ ST 0.15 mg/m ³ [skin] OSHA† 0.05 mg/m ³ Inhal	2.5 mg/m ³	Fluffy, colorless to white (sometimes dyed black), odorless powder. [rodenticide] [Note: A liquid above 95°F.]	MW: 100.0 BP: Decomposes Sol: Miscible FLP: NA IP: 7	VP: Low MLT: 392°F UEL: NA LEL: NA	None reported	Filter; Water; IC; IR(S) [#5301]

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 8)
Skin:	N.R.	TBAL	Inh Ing Con	Irr/eyes, skin, muc memb	Eye: Breath: Swallow:	Eyes, skin, resp sys
Eyes:	N.R.				Irr/med Fresh air Medical attention immed	
Wash skin:	N.R.					
Remove:	N.R.					
Change:	N.R.					
[Sodium bisulfite]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irr/eyes, skin, asphy,	Eye	Eyes, skin, CVS, CNS,
Eyes:	Prevent eye contact	25 mg/m ³ SA/SCBAF	Abs	weak, head, conf, nau,	Skin	thyroid, blood
Wash skin:	When contam	5 SCBAF PD PP/SAF PD PP ASCBA	Ing	vomit, incr resp rate,	Breath	
Remove:	When wet or contam	Escape: GMFSHE/SCBAE	Con	slow gasping respiration, thyroid, blood changes	Swallow	
Change:	Daily					
Provide:	Eyewash, Quick drench					
[Sodium cyanide (as CN)]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irr/eyes, resp sys, nau,	Eye	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	12.5 mg/m ³ DM	Ing	abdom pain, diarr, saliv,	Skin	CNS, skeleton,
Wash skin:	When contam	25 mg/m ³ DMXSO/SA*	Con	thirst, sweat, stiff spine	Breath	kidneys
Remove:	When wet or contam	62.5 mg/m ³ SA CF/PAPROM*		derm. calcification of ligaments of ribs, pelvis	Swallow	
Change:	Daily	125 mg/m ³ HEF+SCBAF/SAF				
		250 mg/m ³ SAF+PD,PP				
		5 SCBAF PD PP/SAF PD PP ASCBA				
		Escape: HEF+SCBAE				
[Sodium fluoride (as F)]						
*Note: May need acid gas sorbent						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Vomit, apnoe, auditory	Eye	Resp sys, CVS, liver,
Eyes:	Prevent eye contact	0.25 mg/m ³ DM	Abs	halu, facial pares, twitch	Skin	kidneys, CNS
Wash skin:	When contam	0.5 mg/m ³ DMXSO/SA	Ing	face, musc, pulsus alternans,	Breath	
Remove:	When wet or contam	1.25 mg/m ³ SA CF/PAPROM	Con	ectopic heartbeat, tacer,	Swallow	
Change:	Daily	2.5 mg/m ³ HEF/SAT CF/PAPRTHIE/		venif, pulm edema,		
Provide:	Quick drench	SCBAF/SAF		nystagmus, convuls,		
		5 SCBAF PD PP/SAF PD PP ASCBA		liver, kidney damage		
		Escape: HEF/SCBAE				
[Sodium fluoroacetate]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TLV unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL, Fl, P, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Sodium hydroxide NaOH 1310-73-2 WB4900000	Caustic soda, Lye, Soda lye, Sodium hydrate	NIOSH C 2 mg/m ³ OSHA† 2 mg/m ³	10 mg/m ³	Colorless to white, odorous solid (flakes, beads, granular form)	MW: 40.0 BP: 2534°F Sol: 111% Fl: P: NA IP: NA Sp Gr: 2.13 Noncombustible Solid, but when in contact with water may generate sufficient heat to ignite combustible materials	VP: 0 mm (approx) MLT: 505°F UEL: NA LEL: NA	Water, acids, flammable liquids, organic halogens, metals such as aluminum, tin & zinc, nitromethane [Note: Corrosive to metals]	Filter; HCL Titrate; II [#7401, Alkaline Dusts]
1823 60 (solid) 1824 60 (solution)								
Sodium metabisulfite Na ₂ S ₂ O ₅ 7881-67-4 UX8225000	Disodium pyrosulfite, Sodium metabisulfite, Sodium pyrosulfite	NIOSH 5 mg/m ³ OSHA† none	N.D.	White to yellowish crystals or powder with an odor of sulfur dioxide.	MW: 190.1 BP: Decomposes Sol: 54% Fl: P: NA IP: NA Sp Gr: 1.4 Noncombustible Solid	VP: ? MLT: >302°F (Decomposes) UEL: NA LEL: NA	Heat (decomposes) [Note: Slowly oxidized to the sulfate on exposure to air & moisture.]	Filter; none; Grav; II [#0500, Nuisance Dust (total)]
Starch (C ₆ H ₁₀ O ₅) _n 9005-25-8 GM5080000	Corn starch, Rice starch, Sorghum gum, α-Starch, Starch gum, Tapioca starch	NIOSH 10 mg/m ³ (total) 5 mg/m ³ (resp) OSHA 15 mg/m ³ (total) 5 mg/m ³ (resp)	N.D.	Fine, white, odor- less powder. [Note: A carbohy- drate polymer composed of 25% amylose & 75% amylopectin.]	MW: varies BP: Decomposes Sol: Insoluble Fl: P: NA IP: NA Sp Gr: 1.45 Noncombustible Solid, but may form explosive mixture with air.	VP: 0 mm (approx) MLT: Decomposes UEL: NA LEL: NA MEC: 50 g/m ³	Oxidizers, acids, iodine, alkalis	Filter; none; Grav; II [Nuisance Dust: #0500 (total), #0600 (resp)]
Stibine SbH ₃ 7803-52-3 WJ0700000	Antimony hydride, Antimony trihydride, Hydrogen antimonide	NIOSH/OSHA 0.1 ppm (0.5 mg/m ³)	5 ppm	Colorless gas with a disagreeable odor like hydrogen sulfide	MW: 124.8 BP: -11°F Sol: Slight Fl: P: NA (Gas) IP: 9.51 eV	VP: >1 atm FRZ: -126°F UEL: ? LEL: ?	Acids, halogenated hydrocarbons, oxidizers, moisture, chlorine, ozone, ammonia	Si gel*, HCL; Vis; II [#6008]

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 8)		Target organs (See Table 8)
Skin:	Prevent skin contact	NIOSH/OSHA 10 mg/m ³ : SA, CF/HIEF/PAPDM/ SCBAF/SAF § SCBAF PD PP/SAF PD, PP ASCBA Escape: HIEF/SCBAE	Inh	Irrit eyes, skin, muc memb; pneutis, eye, skin burns, temporary loss of hair	Eye:	Irr immed Water flush immed Resp support Medical attention immed	Eyes, skin, resp sys
Eyes:	Prevent eye contact		Ing		Skin:		
Wash skin:	When contam		Con		Breath:		
Remove:	When wet or contam				Swallow:		
Change:	Daily						
Provide:	Eyewash, Quick drench						
[Sodium hydroxide]							
Skin:	N.R.	TBAL	Inh	Irrit eyes, skin, muc memb	Eye:	Irr immed Fresh air Medical attention immed	Eyes, skin, resp sys
Eyes:	N.R.		Ing		Breath:		
Wash skin:	N.R.		Con		Swallow:		
Remove:	N.R.						
Change:	N.R.						
[Sodium metabisulfite]							
Skin:	Prevent skin contact	TBAL	Inh	Irrit eyes, skin, muc memb; cough, chest pain; dermat rinit	Eye:	Irr immed Soap wash Fresh air Medical attention immed	Eyes, skin, resp sys
Eyes:	Prevent eye contact		Ing		Skin:		
Wash skin:	Daily		Con		Breath:		
Remove:	When wet or contam				Swallow:		
Change:	Daily						
[Starch]							
Skin:	N.R.	NIOSH/OSHA 1 ppm: SA 2.5 ppm: SA, CF 5 ppm: SAT, CF/SCBAF/SAF § SCBAF PD PP/SAF PD, PP ASCBA Escape: GMFS/SCBAE	Inh	Head: weak, nau, abdom pain, lumbar pain, hemog, hema, hemolytic anemia, jaun, pulm irrit	Breath:	Resp support	Blood, liver, kidneys, resp sys
Eyes:	N.R.						
Wash skin:	N.R.						
Remove:	N.R.						
Change:	N.R.						
[Stibine]							

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P., IP, Sp. Gr, flammability	VP, FRZ UEL, LEL		
Stoddard solvent	Dry cleaning safety solvent, Mineral spirits, Petroleum solvent, Spotting naphtha [Note: A refined petroleum solvent with a flash point of 102-110°F, boiling point of 309-396°F, and containing >65% C ₁₀ or higher hydrocarbons.]	NIOSH 350 mg/m ³ C 1800 mg/m ³ [15-min]	20,000 mg/m ³	Colorless liquid with a kerosene- like odor	MW Varies BP 309-396°F Sol Insoluble Fl P 102-110°F IP ?	VP ? FRZ ? UEL ? LEL ?	Strong oxidizers	Char. CS, GC/FID, II [#1550]
8052-41-3 WJ8925000		OSHA† 500 ppm (2900 mg/m ³)			Sp Gr 0.78 Class II Combustible Liquid			
1268-27 (petroleum distillate)								
Strychnine	Nuxvomica Strychnos	NIOSH/OSHA 0.15 mg/m ³	3 mg/m ³	Colorless to white odorless, crystalline solid [pesticide]	MW 334.4 BP Decomposes Sol 0.02% Fl P ? IP ?	VP Low MLT 514°F UEL ? LEL ?	Strong oxidizers	Filter, Reagent, HPLC/UV/D, III [#5016]
C ₂₁ H ₃₃ N ₂ O ₂								
57-24-9 WL2275000								
1692-53					Sp Gr 1.36 Combustible Solid, but difficult to ignite			
Styrene	Ethynyl benzene, Phenylethylenes Styrene monomer, Styrol, Vinyl benzene	NIOSH 50 ppm [215 mg/m ³] ST 100 ppm [425 mg/m ³] OSHA† 100 ppm C 200 ppm 600 ppm [5-min max peak in any 3 hrs]	700 ppm	Colorless to yellow, oily liquid with a sweet, floral odor	MW 104.2 BP 292°F Sol: 0.03% Fl P 88°F IP 8.40 eV	VP 5 mm FRZ -23°F UEL 5.8% LEL 0.9%	Oxidizers, catalysts for vinyl polymers; peroxides strong acids aluminum chloride [Note: May polymerize if contaminated or subjected to heat. Usually contains an inhibitor such as tert-butylcatechol.]	Char. CS, GC/FID, III [#1501, Aromatic Hydro- carbons]
C ₈ H ₈ CH=CH ₂								
100-42-5 WL3675000								
2055-27 (inhibited)	1 ppm = 4.33 mg/m ³				Sp Gr 0.91 Class IC Flammable Liquid			
Subtilisin	Bacillus subtilis, Bacillus subtilis BPN, Bacillus subtilis Carlsburg, Proteolytic enzymes, Subtilisin BPN, Subtilisin Carlsburg [Note: Commercial proteolytic enzymes are used in laundry]	NIOSH ST 0.00006 mg/m ³ [60-min]	N.D.	Light-colored, free-flowing powders. [Note: A protein containing numerous amino acids.]	MW: 28,000 (approx) BP: ? Sol: ? Fl P: NA IP: NA	VP: 0 mm (approx) MLT: ? UEL: NA LEL: NA	None reported	None available
1395-21-7 (BPN) 9014-01-1 (Carlsburg) C09450000 (BPN) C09550000 (Carlsburg)		OSHA† none			So. Gr: ?			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 6)
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R.	NIOSH 3500 mg/m ³ : CCROV*/SA* 8750 mg/m ³ : SA:CF*/PAPROV* 17,500 mg/m ³ : CCRFOV/GMFOV/ PAPROV*/SCBAF/SAF 20,000 mg/m ³ : SAF:PD,PP § SCBAF PD PP/SAF PD,PP ASCBA Escape: GMFOV/SCBAE	Inh ing Con	Irrit eyes, nose, throat; dizz, derm, chemical pneu (aspirilq); In animals: kidney damage	Eye: Skin: Breath: Swallow: Medical attention immed	Eyes, skin, resp sys, CNS, kidneys
[Stoddard solvent]						
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact N.R. When contam N.R. Daily	NIOSH/OSHA 0.75 mg/m ³ : DM 1.5 mg/m ³ : DMXSO/SA 3 mg/m ³ : SA:CF*/PAPROV*/HIEF/ SCBAF/SAF § SCBAF PD PP/SAF PD,PP ASCBA Escape: HIEF/SCBAE	Inh ing Con	Stiff neck, facial musc, restless, apnea, incr acuity of perception; incr reflex excitability; cyan, tetanic convuls with opisthotonos	Eye: Skin: Breath: Swallow: Medical attention immed	CNS
[Strychnine]						
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet (flamm) N.R.	NIOSH 500 ppm: CCROV*/SA* 700 ppm: SA:CF*/CCROV*/GMFOV/ PAPROV*/SCBAF/SAF § SCBAF PD PP/SAF PD,PP ASCBA Escape: GMFOV/SCBAE	Inh Abs ing Con	Irrit eyes, nose, resp sys; head, fig, dizz, conf, mal, drow, weak, unsteady gait, narco, defatting derm, possible liver inj, repro effects	Eye: Skin: Breath: Swallow: Medical attention immed	Eyes, skin, resp sys, CNS, liver, repro sys
[Styrene]						
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet or contam Daily	TBAL	Inh ing Con	Irrit eyes, skin, resp sys; resp sens (asthyme salivna); sweat, head, chest pain, flu-like symptoms, cough, breathlessness, wheez	Eye: Skin: Breath: Swallow: Medical attention immed	Eyes, skin, resp sys
[Sublimins]						

Chemical name, structural formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL F.P., IP, Sp. Gr, flammability	VP, FRZ UEL, LEL		
Succinonitrile <chem>NCCH2CH2CN</chem> 110-81-2 WN3850000	Butenedinitrile; 1,2-Dicyanoethane; Dinile; Ethylene cyanide; Ethylene dicyanide; Succinic dinitrile	NIOSH 8 ppm (20 mg/m ³) OSHA none	N.D.	Colorless, waxy solid. [Note: Forms cyanide in the body.]	MW: 80.1 BP: 509°F Sol: 13% F.P.: 270°F IP: ? Sp.Gr: 0.99 Combustible Solid	VP(212°F): 2mm MLT: 134°F UEL: ? LEL: ?	Oxidizers	Char; Toluene; GC/FID; NIOSH Nites
Sucrose <chem>C12H22O11</chem> 57-50-1 WN6500000	Beet sugar, Cane sugar, Confectioner's sugar, Granulated sugar, Rock candy, Saccharose, Sugar, Table sugar	NIOSH 10 mg/m ³ (total) 8 mg/m ³ (resp) OSHA 16 mg/m ³ (total) 8 mg/m ³ (resp)	N.D.	Hard, white, odorless crystals, lumps, or powder. [Note: May have a characteristic, caramel odor when heated.]	MW: 342.3 BP: Decomposes Sol: 200% F.P.: NA IP: NA Sp.Gr: 1.59 Noncombustible Solid, but fine airborne dust may explode.	VP: 0 mm (approx) MLT: 320-387°F (Decomposes) UEL: NA LEL: NA MEC: 45 g/m ³	Oxidizers, sulfuric acid, nitric acid	Filter; none; Grav; IR Nuisance Dust: #0500 (total), #0500 (resp)]
Sulfur dioxide <chem>SO2</chem> 7446-09-5 WS4550000	Sulfurous acid anhydride, Sulfurous oxide, Sulfur oxide	NIOSH 2 ppm (5 mg/m ³) ST 5 ppm (13 mg/m ³) OSHA† 5 ppm (13 mg/m ³)	100 ppm	Colorless gas with a characteristic, irritating, pungent odor. [Note: A liquid below 14°F Shipped as a liquefied compressed gas.]	MW 64.1 BP 14°F Sol 10% F.P. NA IP 12.30 eV RGasD: 2.26 Nonflammable Gas	VP 3.2 atm FRZ -104°F UEL NA LEL NA	Powdered alkali metals (such as sodium & potassium), water, ammonia, zinc, aluminum, brass, copper, etc. [Note: Reacts with water to form sulfurous acid (H ₂ SO ₃).]	Filters(2), NaHCO ₃ / Na ₂ CO ₃ / CC, #6004]
Sulfur hexafluoride <chem>SF6</chem> 2551-82-4 WS4900000	Sulfur fluoride [Note: May contain highly toxic sulfur pentafluoride as an impurity.]	NIOSH/OSHA 1000 ppm (6000 mg/m ³)	N.D.	Colorless, odorless gas. [Note: Shipped as a liquefied compressed gas. Condenses directly to a solid upon cooling.]	MW: 146.1 BP: Sublimes Sol(77°F): 0.003% F.P.: NA IP: 19.30 eV RGasD: 6.11 Nonflammable Gas	VP: 21.5 atm FRZ: -83°F (Sublimes) UEL: NA LEL: NA	Oil/solene	Bag; none; GC/TEA; H(5) [#5244]
1080 12	1 ppm = 8.07 mg/m ³							

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, skin, resp sys;	Eye:	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	60 ppm: SA	Abs	head, dizz, weak, gidd,	Skin:	CNS, CVS
Wash skin:	When contam	150 ppm: SA: CF	ing	conf, convulse; blurred	Breath:	
Remove:	When wet or contam	250 ppm: SCBAF/SAF	Con	vision; dysp; abdom pain,	Swallow:	
Change:	Daily	§ SCBAF PD, PP/SAF PD, PP ASCBA		nausea, vomit		
Provide:	Eyewash	Escape: GMFOV/SCBAE				
[Succinylcholine]						
Skin:	N.R.	TBAL	Inh	Irrit eyes, skin, upper	Eye:	Eyes, resp sys
Eyes:	N.R.		Con	resp sys; cough	Breath:	
Wash skin:	N.R.				Irr	Fresh air
Remove:	N.R.					
Change:	N.R.					
[Sucrose]						
Skin:	Frostbite	NIOSH	Inh	Irrit eyes, nose, throat,	Eye:	Eyes, skin, resp sys
Eyes:	Frostbite	20 ppm: CCRS/SA*	Con	rhin, choking cough,	Skin:	
Wash skin:	N.R.	50 ppm: SA CF/PPAPRS*		reflex: bronchoconstriction,	Breath:	Frostbite
Remove:	When wet or contam (liq)	100 ppm: CCRFS/GMFS/PAPRTS*/		liq, frostbite		Resp support
Change:	N.R.	SAT CF/SCBAF/SAF				
Provide:	Frostbite	§ SCBAF PD, PP/SAF PD, PP ASCBA				
		Escape: GMFS/SCBAE				
[Sulfur dioxide]						
Skin:	Frostbite	TBAL	Inh	Asphy: incr breath rate,	Eye:	Resp sys
Eyes:	Frostbite			pulse rate; slight musc	Skin:	
Wash skin:	N.R.			inco, emotional upset;	Breath:	Frostbite
Remove:	N.R.			flg, nausea, vomit, convulse		Resp support
Change:	N.R.					
Provide:	Frostbite					
[Sulfur hexafluoride]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P., IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Sulfuric acid H_2SO_4 7564-93-9 WS5600000 1830 39 (51-95% acid) 1831 39 (fuming) 1832 39 (apert)	Battery acid, Hydrogen sulfate, Oil of vitriol, Sulfuric acid (aqueous)	NIOSH/OSHA 1 mg/m ³	15 mg/m ³	Colorless to dark- brown, oily odorless liquid. [Note: Pure compound is a solid below 51°F. Often used in an aqueous solution.]	MW: 98.1 BP: 554°F Sol: Miscible Fl.P.: NA IP: ? Sp Gr: 1.84 (96-98% acid) Noncombustible Liquid, but capable of igniting finely divided combustible materials	VP: 0.001 mm FRZ: 51°F UEL: NA LEL: NA	Organic materials, chlorates, carbides, fulminates, water, powdered metals [Note: Reacts violently with water with evolution of heat. Corrosive to metals.]	S: gel. NaHCO ₃ / Na ₂ CO ₃ , IC, III [§7903, Inorganic Acids]
Sulfur monochloride S_2Cl_2 10025-67-9 WS4300000 1828 39	Sulfur chloride, Sulfur subchloride, Thiosulfurous dichloride	NIOSH C 1 ppm (6 mg/m ³) OSHA† 1 ppm (6 mg/m ³)	6 ppm	Light amber to yellow-red, oily liquid with a pungent, nauseating, irritating odor.	MW: 135.0 BP: 280°F Sol: Decomposes Fl.P.: 245°F IP: 940 eV Sp Gr: 1.58 Class IIIB Combustible Liquid	VP: 7 mm FRZ: -107°F UEL: ? LEL: ?	Peroxides, oxides of phosphorus, organics, water [Note: Decomposes violently in water to form hydrochloric acid, sulfur dioxide, sulfur, sulfite, thiosulfate, and hydrogen sulfide. Corrosive to metals.]	None available
Sulfur pentafluoride SF_6 5714-22-7 WS4480000 1 ppm = 10.56 mg/m ³	Disulfur decafluoride, Sulfur decafluoride	NIOSH C 0.01 ppm (0.1 mg/m ³) OSHA† 0.025 pp (0.25 mg/m ³)	1 ppm	Colorless liquid or gas (above 84°F) with an odor like sulfur dioxide	MW: 254.1 BP: 84°F Sol: insoluble Fl.P.: NA IP: ? Sp Gr: (32°F): 2.08 RGasD: 8.77 Noncombustible Liquid Nonflammable Gas	VP: 561 mm FRZ: -134°F UEL: NA LEL: NA	None reported	None available
Sulfur tetrafluoride SF_4 7783-50-6 WT4800000 1 ppm = 4.88 mg/m ³	Tetrafluoro-sulfurane	NIOSH C 0.1 ppm (0.4 mg/m ³) OSHA† none	N.D.	Colorless gas with an odor like sulfur dioxide. [Note: Shipped as a liquefied compressed gas.]	MW: 108.1 BP: -41°F Sol: Reacts Fl.P.: NA IP: 12.63 eV RGasD: 0.70 Nonflammable Gas	VP(70°F): 10.5 mm FRZ: -188°F UEL: NA LEL: NA	Moisture, concentrated sulfuric acid, oxygen difluoride [Note: Readily hydrolyzed by moisture, forming hydrofluoric acid & thionyl fluoride.]	None available

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin, nose,	Eye	Eyes, skin, resp sys, teeth
Eyes:	Prevent eye contact	25 mg/m ³ SA CF*/PAPRAGH/E	Inh	throat, pulm edema; bron,	Irrigated	
Wash skin:	When contam	50 mg/m ³ CCRFAGH/E/GMFAGH/E/	Inh	emphy con; stomatis,	Water flush immed	
Remove:	When wet or contam	SCBAF/SAF	Ing	denial erosion, trachibronc,	Resp support	
Change:	N.R.	80 mg/m ³ SAF PD PP	Con	eye, skin burns, derm	Swallow	
Provide:	Eyewash (>1%), Quick drench (>1%)	§ SCBAF PD PP/SAF PD PP ASCBA Escape GMFAGH/E/SCBAE			Medical attention immed	

[Sulfuric acid]

Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin, muc memb;	Eye	Eyes, skin, resp sys
Eyes:	Prevent eye contact	5 ppm: CCRFS/GMFS/PAPRS*/	Inh	lac cough eye, skin burns,	Irrigated	
Wash skin:	When contam	SCBAF/SAF	Inh	pulm edema	Water flush immed	
Remove:	When wet or contam	§ SCBAF PD PP/SAF PD PP ASCBA	Ing		Resp support	
Change:	N.R.	Escape GMFS/SCBAE	Con		Medical attention immed	
Provide:	Eyewash, Quick drench					

[Sulfur monochloride]

Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, skin, resp sys;	Eye	Eyes, skin, resp sys, CNS
Eyes:	Prevent eye contact	0.1 ppm SA	Inh	in animals: pulm edema,	Irrigated	
Wash skin:	N.R.	0.25 ppm SA CF	Ing	hemorr	Soap wash immed	
Remove:	When wet or contam	0.5 ppm SAT CF/SCBAF/SAF	Con		Resp support	
Change:	N.R.	1 ppm SA PD PP			Medical attention immed	
Provide:	Eyewash, Quick drench	§ SCBAF PD PP/SAF PD PP ASCBA Escape GMFAG/SCBAE				

[Sulfur pentachloride]

Skin:	Frostbite	TBAL	Inh	Irrit eyes, muc memb; eye,	Eye:	Eyes, skin, resp sys
Eyes:	Frostbite		Con	skin burns (from SF ₆ releasing hydrofluoric acid on exposure to moisture); liq frostbite; in animals: dysp, weak, rhin	Skin:	
Wash skin:	N.R.				Breath:	
Remove:	N.R.				Frostbite	
Change:	N.R.				Resp support	
Provide:	Frostbite					

[Sulfur tetrafluoride]

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL, Fl.P, IP, Sp. Gr., flammability	VP, FRZ UEL, LEL		
Sulfuryl fluoride SO_2F_2 2699-79-8 WT5075000	Sulfur difluoride dioxide, Vikane®	NIOSH 5 ppm (20 mg/m³) ST 10 ppm (40 mg/m³) OSHA† 5 ppm (20 mg/m³)	200 ppm	Colorless, odorless gas (insecticide/ fumigant) [Note: Shipped as a liquefied compressed gas.]	MW: 102.1 BP: -68°F Sol: (32°F) 0.2% Fl.P. NA IP: 13.04 eV	VP: (70°F): 15.8 atm FRZ: -212°F UEL: NA LEL: NA	None reported	Char; NaOH; IC; III [#6012]
2191 15	1 ppm = 4.24 mg/m³				RGasD: 3.72 Nonflammable Gas			
Sulprofos $\text{C}_{11}\text{H}_{19}\text{O}_3\text{P}_2\text{S}_3$ 35400-43-2 TE4185000	Bolstar® O-Ethyl O-(4-methylthio)- phenyl S-propyl- phosphorodithioate	NIOSH 1 mg/m³ OSHA† none	N.D.	Ten-colored liquid with a sulfide-like odor.	MW: 322.5 BP: ? Sol: Low Fl.P: ? IP: ?	VP: <8 mm FRZ: ? UEL: ? LEL: ?	None reported	None available
	1 ppm = 13.60 mg/m³				Sp.Gr: 1.20			
2, 4, 5-T $\text{Cl}_3\text{C}_2\text{H}_4\text{OCH}_2\text{COOH}$ 93-76-5 AJ8400000	2, 4, 5-Trichlorophenoxyacetic acid	NIOSH/OSHA 10 mg/m³	250 mg/m³	Colorless to tan, odorless, crystalline solid. [herbicide]	MW: 255.6 BP: Decomposes Sol: (77°F) 0.03% Fl.P. ? IP: ?	VP: <1 x 10⁻⁴ mm MLT: 307°F UEL: ? LEL: ?	None reported	Filter; Methanol HPLC/UVD; III [#5001]
2765 55					Sp. Gr: 1.80 Combustible Solid, but burns with difficulty			
Talc (containing no asbestos and less than 1% quartz) $\text{Mg}_3\text{Si}_2\text{O}_5(\text{OH})_2$ 14807-96-6 WW2710000	Hydrous magnesium silicate, Sleatite talc	NIOSH 2 mg/m³ (resp) OSHA† 20 mppcf	1000 mg/m³	Odorless, white powder.	MW: Varies BP: ? Sol: Insoluble Fl.P. NA IP: NA	VP: 0 mm (approx.) MLT: 1652- 1832°F UEL: NA LEL: NA	None reported	Filter; LTA; XRD; II [P&CAM #355]
					Sp. Gr: 2.70-2.80			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)		Target organs (See Table 5)
Skin:	Frostbite	NIOSH/OSHA	Inh	Conj. rhinitis, pharyngitis,	Eye:	Frostbite	Eyes, skin, resp sys,
Eyes:	Frostbite	50 ppm: SA*	Con	parest. liq: frostbite;	Skin:	Frostbite	CNS, kidneys
Wash skin:	N.R.	125 ppm: SA CF*	(kg)	in animals: narco, tremor,	Breath:	Resp support	
Remove:	N.R.	200 ppm: SCBAF/SAF		convuls; pulm edema, kidney			
Change:	N.R.	§ SCBAF PD PP/SAF PD, PP, ASCBA		inj			
Provide:	Frostbite	Escape: GMFS/SCBAE					
[Sulfuryl fluoride]							
Skin:	Prevent skin contact	TBAL	Inh	Nau, vomit, abdom cramps,	Eye:	Irr. Immed	Resp sys, CNS, CVS,
Eyes:	N.R.		ing	diarr, saliv, head, gidd,	Skin:	Soap wash Immed	blood chol
Wash skin:	When contam			vert, weak; rhin, chest	Breath:	Resp support	
Remove:	When wet or contam			tight; blurred vision,	Swallow:	Medical attention	
Change:	N.R.			myosis; card irreg; musc		Immed	
				fasc; dysp			
[Sulprofos]							
Skin:	N.R.	NIOSH/OSHA	Inh	In animals: ataxia, skin	Eye:	Irr. Immed	Skin, liver, GI
Eyes:	N.R.	50 mg/m ³ : DM	ing	irrit, acne-like rash,	Skin:	Soap wash	tract
Wash skin:	N.R.	100 mg/m ³ : DMXSQ/SA	Con	liver damage	Breath:	Resp support	
Remove:	N.R.	250 mg/m ³ : SA: CF/HIEF/PAPRDM/			Swallow:	Medical attention	
Change:	N.R.	§ SCBAF/SAF				Immed	
		§ SCBAF PD, PP/SAF PD, PP, ASCBA					
		Escape: HIEF/SCBAE					
[2,4,5-T]							
Skin:	N.R.	NIOSH	Inh	Fibrotic pneumoconiosis,	Eye:	Irr. Immed	Eyes, resp sys, CVS
Eyes:	N.R.	10 mg/m ³ : DM	Con	irrit eyes	Breath:	Fresh air	
Wash skin:	N.R.	20 mg/m ³ : DMXSQ/SA					
Remove:	N.R.	50 mg/m ³ : PAPRDM/SA, CF					
Change:	N.R.	100 mg/m ³ : HIEF/SAT, CF/PAPRTHIE/					
		§ SCBAF/SAF					
		1000 mg/m ³ : SA, PD, PP					
		§ SCBAF PD, PP/SAF PD, PP, ASCBA					
		Escape: HIEF/SCBAE					

[Talc (containing no asbestos and less than 1% quartz)]

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL, FI, P, IP, Sp, Gr, flammability	VP, FRZ, UEL, LEL		
Tantalum (metal and oxide dust, as Ta) Ta (Metal) 7440-25-7 (Metal) WV5505000 (Metal)	Tantalum metal Tantalum-181 Synonyms of other tantalum dusts (including oxide dusts) vary depending upon the specific compound	NIOSH 5 mg/m ³ ST 10 mg/m ³ OSHA 5 mg/m ³	2500 mg/m³ (as Ta)	Metal. Steel blue to gray solid or black, odorless powder.	MW 180.9 BP 9797°F Sol Insoluble FI P NA IP NA	VP 0 mm (approx) MLT 5425°F UEL NA LEL NA MEC: <200 g/m ³	Strong oxidizers, bromine trifluoride, fluorine	Filter, none. Grav. III [#0500, Nuisance Dust (total)]
					Sp Gr 15.65 (Metal) 14.40 (Powder) Metal Combustible Solid, powder ignites SPONTANEOUSLY in air			
TEOP [CH ₃ CH ₂ O] ₂ P(=O) ₂ O 3589-24-5 XN4375000 1704 55	Bladefume® Dithion. Sulfotep, Tetraethyl dithiono- pyrophosphate, Tetraethyl dithiopyro- phosphate, Thiotep®	NIOSH/OSHA 0.2 mg/m ³ (skin)	10 mg/m³	Pale-yellow liquid with a garlic-like odor. [Note: A pesticide that may be absorbed on a solid carrier or mixed in a more flammable liquid.]	MW 322.3 BP Decomposes Sol 0.0007% FI P ? IP ?	VP 0.0002 mm FRZ ? UEL ? LEL ?	Strong oxidizers, iron [Note: Corrosive to iron.]	None available
	1 ppm = 13.40 mg/m ³				Sp Gr(77°F) 1.20 Combustible Liquid			
Tellurium Te 13494-80-9 WY2625000	Aurum paradoxum, Metalum problematum	NIOSH/OSHA* 0.1 mg/m ³ [*Note: The REL and PEL also apply to other tellurium compounds (as Te) except Tellurium hexafluoride, and Bismuth telluride.]	25 mg/m³ (as Te)	Odorless, dark-gray to brown, amorphous powder or grayish-white, brittle solid.	MW 127.6 BP 1814°F Sol Insoluble FI P NA IP NA	VP 0 mm (approx) MLT 542°F UEL NA LEL NA	Oxidizers, chlorine, cadmium	Filter, Acid, AAS; III(3) [#S204]
					Sp Gr 6.24 Combustible Solid			
Tellurium hexafluoride (as Te) TeF₆ 7793-80-4 WY2800000	Tellurium fluoride	NIOSH/OSHA 0.02 ppm (0.2 mg/m ³)	1 ppm	Colorless gas with a repulsive odor.	MW 241.6 BP Sublimes Sol Decomposes FI P NA IP ?	VP >1 atm FRZ -36°F (Sublimes) UEL NA LEL NA	Water [Note: Hydrolyzes slowly in water to telluric acid.]	Char, NaOH, AAS; III(3) [#S187]
					RGasD: 8.34 Nonflammable Gas			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards					
			Route	Symptoms (See Table 6)	First aid (See Table 6)	Target organs (See Table 6)		
Skin:	N.R.	NIOSH/OSHA	Inh	Irrit eyes, skin;	Eye:	Irr	Immediate	Eyes, skin, resp sys
Eyes:	N.R.	25 mg/m ³ DM ^a	Con	in animals: pulm irrit	Breath:	Resp support		
Wash skin:	N.R.	50 mg/m ³ DMXSO ^a /DMFw/SA						
Remove:	N.R.	125 mg/m ³ SA CF/PAPRDM ^a						
Change:	N.R.	250 mg/m ³ H ₂ EF/SAT CF/PAPRTH ₂ E/ SCBAF/SAF						
		2500 mg/m ³ SA PD PP						
		6 SCBAF PD PP/SAF PD PP ASCBA						
		Escape: H ₂ EF/SCBAE						
[Tantalum (metal and oxide dust, as Ta)]								
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin, eye pain,	Eye:	Irr	Immediate	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	2 mg/m ³ SA	Abs	blurred vision, lac, rin,	Skin:	Soap wash	immed	CNS, CVS, blood chol
Wash skin:	When contam	5 mg/m ³ SA CF	Ing	head, cyan, anor, nau,	Breath:	Resp support		
Remove:	When wet or contam	10 mg/m ³ SCBAF/SAF	Con	vomit, diarr, local sweat,	Swallow:	Medical attention	immed	
Change:	N.R.	6 SCBAF PD PP/SAF PD PP ASCBA		weak, twitch, para,				
Provide:	Eyewash, Quick drench	Escape: GMFOVH ₂ E/SCBAE		Cheyne-Stokes respiration, convuls, low BP, card irreg				
[TEOP]								
Skin:	N.R.	NIOSH/OSHA	Inh	Garlic breath, sweat, dry	Eye:	Irr	Immediate	Skin, CNS, blood
Eyes:	N.R.	0.5 mg/m ³ DM ^a	Ing	mouth, metallic taste, som;	Skin:	Soap wash	prompt	
Wash skin:	N.R.	1 mg/m ³ DMXSO ^a /DMFw/SA	Con	anor, nau, no sweat, derm;	Breath:	Resp support		
Remove:	N.R.	2.5 mg/m ³ SA CF/PAPRDM ^a		in animals: CNS, red	Swallow:	Medical attention	immed	
Change:	N.R.	5 mg/m ³ H ₂ EF/SAT CF/PAPRTH ₂ E/ SCBAF/SAF		blood cell effects				
		25 mg/m ³ SA PD PP						
		6 SCBAF PD PP/SAF PD PP ASCBA						
		Escape: H ₂ EF/SCBAE						
[Tellurium]								
Skin:	N.R.	NIOSH/OSHA	Inh	Head, dysp, garlic breath,	Breath:	Resp support		Resp sys
Eyes:	N.R.	0.2 ppm SA		in animals: pulm edema				
Wash skin:	N.R.	0.5 ppm SA CF						
Remove:	N.R.	1 ppm SAT CF/SCBAF/SAF						
Change:	N.R.	6 SCBAF PD PP/SAF PD PP ASCBA						
		Escape: GMFS/SCBAE						

[Tellurium hexafluoride (as Te)]

Chemical name, structure formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Temphos $S[C_6H_4OP(S)(OCH_3)_2]_3$ 3383-96-8 TF6890000	Abate®; Temefos; O,O,O',O'-Tetramethyl O,O'- thiodi-p-phenylene phosphorothioate	NIOSH 10 mg/m³ (total) 5 mg/m³ (resp) OSHA† 15 mg/m³ (total) 5 mg/m³ (resp)	N.D.	White, crystalline solid or liquid (above 87°F). [insecticide] [Note: Technical grade is a viscous, brown liquid.]	MW: 466.5 BP: 248-257°F (Decomposes) Sol: Insoluble FLP: ? IP: ? Sp.Gr: 1.32 Combustible Solid	VP(77°F): 0.0000007 mm MLT: 87°F UEL: ? LEL: ?	None reported	None available
TEPP $[C_6H_5CH_2O]_3PO_2$ 107-49-3 UX6825000 2783 55	Ethyl pyrophosphate, Tetraethyl pyrophosphate, Tetron®	NIOSH/OSHA 0.05 mg/m³ [skin]	5 mg/m³	Colorless to amber liquid with a faint, fruity odor. [insecticide] [Note: A solid below 32°F.]	MW: 290.2 BP: Decomposes Sol: Miscible FLP: NA IP: ? Sp.Gr: 1.19 Noncombustible Liquid	VP: 0.00015 mm FRZ: 32°F UEL: NA LEL: NA	Strong oxidizers, alkalis, water [Note: Hydrolyzes quickly in water to form pyrophosphoric acid.]	Chrom-102 (2); Toluene; GC/FPD; IR [#2504, Tetraethyl Pyrophos- phate]
o-Terphenyl $C_6H_5C_6H_4C_6H_5$ 84-15-1 WZ6472000	o-Diphenylbenzene; 1,2-Diphenylbenzene; 2-Phenylbiphenyl; 1,2-Terphenyl; ortho-Terphenyl; o-Triphenyl	NIOSH 5 mg/m³ (0.5 ppm) OSHA† 9 mg/m³ (1 ppm)	500 mg/m³	Colorless or light- yellow solid.	MW: 230.3 BP: 630°F Sol: Insoluble FLP(oc): 325°F IP: 7.99 eV Sp.Gr: 1.1 Combustible Solid	VP: Very low MLT: 136°F UEL: ? LEL: ?	None reported	Filter; CS; GC/FPD; IR [85021]
m-Terphenyl $C_6H_5C_6H_4C_6H_5$ 92-05-8 WZ6470000	m-Diphenylbenzene; 1,3-Diphenylbenzene; Isodiphenylbenzene; 3-Phenylbiphenyl; 1,3-Terphenyl; meta-Terphenyl; m-Triphenyl	NIOSH 5 mg/m³ (0.5 ppm) OSHA† 9 mg/m³ (1 ppm)	500 mg/m³	Yellow solid (needles).	MW: 230.3 BP: 689°F Sol: Insoluble FLP(oc): 375°F IP: 8.01 eV Sp.Gr: 1.23 Combustible Solid	VP: Very low MLT: 192°F UEL: ? LEL: ?	None reported	Filter; CS; GC/FPD; IR [85021]

† Values are @ 85°F standard

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	Prevent skin contact	TBAL	Inh	Irrit eyes, blurred vision;	Eye:	Eyes, resp sys, CNS,
Eyes:	Prevent eye contact		Abs	dizz, conf; dysp; saliv;	Skin:	CVS, blood chol
Wash skin:	When contam		Ing	abdom cramps, nau, diarr,	Breath:	
Remove:	When wet or contam		Con	vomit	Swallow:	
Change:	Daily					
[Terphenyls]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Eye pain, blurred vision,	Eye:	Eyes, resp sys, CNS,
Eyes:	Prevent eye contact	0.5 mg/m ³ SA	Abs	lac, rhin, head, chest tight,	Skin:	CVS, GI tract,
Wash skin:	When contam	1.25 mg/m ³ SA CF	Ing	cyan, anor, nau, vomit,	Breath:	blood chol
Remove:	When wet or contam	2.5 mg/m ³ SAT CF/SCBAF/SAF	Con	diarr, weak, brich, para,	Swallow:	
Change:	N.R.	5 mg/m ³ SA PD PP		Cheyne-Stokes respiration,		
Provide:	Eyewash, Quick drench	§ SCBAF PD PP/SAF PD PP ASCBA		convuls, low BP, card		
		Escape: GMFOVHE/SCBAE		irrag, sweat		
[TEPP]						
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, skin, muc memb;	Eye:	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	25 mg/m ³ DM ⁶	Ing	thermal skin burns, head,	Skin:	liver, kidneys
Wash skin:	When contam	50 mg/m ³ DMXSO ² /SA ⁴	Con	sore throat,	Breath:	
Remove:	When wet or contam	125 mg/m ³ SA CF/PAPRDM ⁶		In animals: liver, kidney	Swallow:	
Change:	Daily	250 mg/m ³ HIEF/SCBAF/SAF		damage		
Provide:	Eyewash, Quick drench	500 mg/m ³ SAF PD PP				
		§ SCBAF PD PP/SAF PD PP ASCBA				
		Escape: HIEF/SCBAE				
[o-Terphenyl]						
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, skin, muc memb;	Eye:	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	25 mg/m ³ DM ⁶	Ing	thermal skin burns, head,	Skin:	liver, kidneys
Wash skin:	When contam	50 mg/m ³ DMXSO ² /SA ⁴	Con	sore throat,	Breath:	
Remove:	When wet or contam	125 mg/m ³ SA CF/PAPRDM ⁶		In animals: liver, kidney	Swallow:	
Change:	Daily	250 mg/m ³ HIEF/SCBAF/SAF		damage		
Provide:	Eyewash, Quick drench	500 mg/m ³ SAF PD PP				
		§ SCBAF PD PP/SAF PD PP ASCBA				
		Escape: HIEF/SCBAE				

[m-Terphenyl]

Chemical name, structural formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
p-Terphenyl <chem>C6H5-C6H4-C6H5</chem> 92-84-4 W25475000	p-Diphenylbenzene; 1,4-Diphenylbenzene; 4-Phenylbiphenyl; 1,4-Terphenyl; para-Terphenyl; p-Triphenyl	NIOSH C 5 mg/m ³ (0.5 ppm) OSHA† C 5 mg/m ³ (1 ppm)	500 mg/m ³	White or light- yellow solid.	MW: 230.3 BP: 761°F Sol: Insoluble FLP: 408°F IP: 7.78 eV	VP: Very low MLT: 418°F UEL: ? LEL: ?	None reported	Fiber; CS; GCFID; B [#5021]
	1 ppm = 9.57 mg/m ³				Sp, Gr: 1.23 Combustible Solid			
2,3,7,8-Tetrachloro- dibenzo-p-dioxin <chem>C12H4Cl4O2</chem> 1746-01-4 HP3500000	Dioxin; Dioxine; TCDD; TCDD; 2,3,7,8-TCDD [Note: Formed during past production of 2,4,5-tri- chlorophenol, 2,4,5-T & 3,2,4,5-tetrachlorophenoxy- propionic acid.]	NIOSH Ca See Appendix A OSHA none	Ca [N.D.]	Colorless to white, crystalline solid. [Note: Exposure may occur through contact at previously contaminated worksites.]	MW: 322.0 BP: Decomposes Sol: 0.00000002% FLP: ? IP: ?	VP(77°F): 0.000002 mm MLT: 581°F UEL: ? LEL: ?	UV light (decomposes)	None available
					Sp, Gr: 7			
1,1,1,2-Tetrachloro- 2,2-difluoroethane <chem>CCl3CClF2</chem> 76-11-9 K1425000	2,2-Difluoro-1,1,1,2- tetrachloroethane; Freon® 112a; Halocarbon 112a; Refrigerant 112a	NIOSH/OSHA 500 ppm (4170 mg/m ³)	2000 ppm	Colorless solid with a slight, ether-like odor. [Note: A liquid above 105°F.]	MW: 203.8 BP: 197°F Sol: 0.01% FLP: NA IP: ?	VP: 40 mm MLT: 105°F UEL: NA LEL: NA	Chemically-active metals such as potassium, beryllium, powdered aluminum, zinc, magnesium, calcium & sodium, acids	Char; CS; GCFID; B [#1016]
	1 ppm = 8.47 mg/m ³				Sp, Gr: 1.65 Noncombustible Solid			
1,1,2,2-Tetrachloro- 1,2-difluoroethane <chem>CCl2FCCl2F</chem> 76-12-0 K1420000	1,2-Difluoro-1,1,2,2- tetrachloroethane; Freon® 112; Halocarbon 112; Refrigerant 112	NIOSH/OSHA 500 ppm (4170 mg/m ³)	2000 ppm	Colorless solid or liquid (above 77°F) with a slight, ether-like odor.	MW: 203.8 BP: 199°F Sol(77°F): 100% FLP: NA IP: 11.30 eV	VP: 40 mm MLT: 77°F UEL: NA LEL: NA	Chemically-active metals such as potassium, beryllium, powdered aluminum, zinc, magnesium, calcium & sodium, acids	Char; CS; GCFID; B [#1016]
	1 ppm = 8.47 mg/m ³				Sp, Gr: 1.65 Noncombustible Solid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	Prevent skin contact	NIOSH	Inh	Irritates skin, muc memb;	Eye	Eyes, skin, resp sys
Eyes:	Prevent eye contact	25 mg/m ³ DM ^a	Ing	thermal skin burns, head,	Skin	liver, kidneys
Wash skin:	When contam	50 mg/m ³ DMXSO ^a /SA ^a	Con	sore throat;	Breath	
Remove:	When wet or contam	125 mg/m ³ SA CF/PAPRDM ^a		in animals: liver, kidney	Swallow	
Change:	Daily	250 mg/m ³ H ₂ EF/SCBAF/SAF		damage		
Provide:	Eyewash, Quick drench	500 mg/m ³ SAF PD PP				
		& SCBAF PD PP/SAF PD PP ASCBA				
		Escape: H ₂ EF/SCBAE				
[p-Terphenyl]						
Skin:	Prevent skin contact	NIOSH	Inh	Irritates eyes; allergic derm,	Eye	Eyes, skin, liver,
Eyes:	Prevent eye contact	& SCBAF PD PP/SAF PD PP ASCBA	Abs	chloracne; porphyria, GI	Skin	kidneys, repro sys
Wash skin:	When contam	Escape: GMFOVH ₂ E/SCBAE	Ing	dist; possible repro,	Breath	[in animals:
Remove:	When wet or contam		Con	terato effects;	Swallow:	tumors at
Change:	Daily			in animals: liver, kidney		many sites]
Provide:	Eyewash, Quick drench			damage; hemorr; [canc]		
[2,3,7,8-Tetrachloro-dibenzo-p-dioxin]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irritates eyes, skin CNS	Eye	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	2000 ppm: SA/SCBAF	Ing	depress, pulm edema, drow,	Skin	CNS
Wash skin:	When contam	& SCBAF PD PP/SAF PD PP ASCBA	Con	dysp	Breath	
Remove:	When wet or contam	Escape: GMFOV/SCBAE			Swallow	
Change:	N.R.					
[1,1,1,2-Tetrachloro-2,2-difluoroethane]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	In animals: irritates eyes,	Eye	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	2000 ppm: SA/SCBAF	Ing	skin, conj, pulm edema,	Skin	CNS
Wash skin:	When contam	& SCBAF PD PP/SAF PD PP ASCBA	Con	nasal	Breath	
Remove:	When wet or contam	Escape: GMFOV/SCBAE			Swallow	
Change:	N.R.					
[1,1,2,2-Tetrachloro-1,2-difluoroethane]						

Chemical name, structural formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
1,1,1,2-Tetrachloro- ethane <chem>CCl3CH2Cl</chem> 630-20-8 K18450000	None	NIOSH Handle with caution in the workplace. See Appendix C (Chloroethanes)	N.D.	Yellowish-red liquid.	MW: 167.9 BP: 267°F Sol: 0.1% Fl.P: 7 IP: 7	VP(77°F): 14mm FRZ: -94°F UEL: ? LEL: ?	Potassium; sodium; dinitrogen tetroxide; potassium hydroxide; nitrogen tetroxide; sodium potassium alloy; 2,4-dinitrophenyl disulfide	None available
1702 55	1 ppm = 7.00 mg/m ³	OSHA none			Sp.Gr: 1.54			
1,1,1,2-Tetrachloro- ethane <chem>CHCl2CHCl2</chem> 79-34-5 K18575000	Acetylene tetrachloride. Symmetrical tetrachloro- ethane	NIOSH Ca See Appendix A See Appendix C (Chloroethanes) 1 ppm (7 mg/m ³) [skin] OSHA† 5 ppm (35 mg/m ³) [skin]	Ca [100 ppm]	Colorless to pale- yellow liquid with a pungent, chloroform-like odor	MW: 167.9 BP: 296°F Sol: 0.3% Fl.P: NA IP: 11.10 eV	VP: 5 mm FRZ: -33°F UEL: NA LEL: NA	Chemically active metals, strong caustics, fuming sulfuric acid [Note: Degrades slowly when exposed to air.]	Char.(pel). CS, GCFID, II [#1019]
1702 55	1 ppm = 7.00 mg/m ³				Sp.Gr(77°F): 1.59 Noncombustible Liquid			
Tetrachloroethylene <chem>C2Cl4</chem> 127-18-4 KX3850000	Perchloroethylene. Perchloroethylene. Perk. Tetrachloroethylene	NIOSH Ca See Appendix A Minimize workplace odor exposure, concentrations, limit number of workers exposed OSHA† 100 ppm C 200 ppm 300 ppm (5-min max peak in any 3 hrs)	Ca [150 ppm]	Colorless liquid with a mild chloroform-like	MW: 165.8 BP: 250°F Sol: 0.02% Fl.P: NA IP: 9.32 eV	VP: 14 mm FRZ: -2°F UEL: NA LEL: NA	Strong oxidizers chemically active metals such as lithium, beryllium & barium, caustic soda, sodium hydroxide, potash	Char, CS, GCFID, III [#1003, Halo- genated Hydro- carbons]
1897 74	1 ppm = 6.89 mg/m ³				Sp.Gr: 1.62 Noncombustible Liquid, but decomposes in a fire to hydrogen chloride and phosgene.			
Tetrachloronaphthalene <chem>C10H6Cl4</chem> 1335-88-2 QK3700000	Halowax®. Niren wax. Seekay wax	NIOSH/OSHA 2 mg/m ³ [skin]	Unknown	Colorless to pale- yellow solid with an aromatic odor.	MW: 265.9 BP: 599-680°F Sol: Insoluble Fl.P(oc): 410°F IP: ?	VP: <1 mm MLT: 360°F UEL: ? LEL: ?	Strong oxidizers	Fiter/Bub. none GCFID, II(2) [#S130]
					Sp.Gr: 1.59-1.65 Combustible Solid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)	
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R. Eyewash, Quick drench	TBAL	Inh Ing Con	Irrit eyes, skin; weak, restless, irreg respiration, muscle inco; In animals: liver changes	Eye: Skin: Breath: Swallow:	Irritated Soap wash Immed Resp support Medical attention Immed	Eyes, skin, CNS, liver
[1,1,1,2-Tetrachloroethane]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R. Eyewash, Quick drench	NIOSH 4 SCBAF PD PP/SAF PD PP ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Nau, vomit, abdom pain, tremor/fingers, jaun, hepatitis, liver tend, dorm, monoc, kidney damage. [carc]	Eye Skin Breath Swallow	Immed Soap wash prompt Resp support Medical attention Immed	Skin, liver, kidneys, CNS, GI tract [In animals: liver tumors]
[1,1,2,2-Tetrachloroethane]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R. Eyewash, Quick drench	NIOSH 4 SCBAF PD PP/SAF PD PP ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, nose, throat, nau, flush face, neck, vert, dizz, inco, head, sore, skin eryt, liver damage. [carc]	Eye Skin Breath Swallow	Immed Soap wash prompt Resp support Medical attention Immed	Eyes, skin, resp sys, liver, kidneys, CNS [In animals: liver tumors]
[Tetrachloroethylene]							
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet or contam Daily	NIOSH/OSHA 20 mg/m ³ SCBAF/SAF 6 SCBAF PD PP/SAF PD PP ASCBA Escape: GMFOVH/E/SCBAE	Inh Abs Ing Con	Acne-form, derm, head, ftg, anor, vert, jaun, liver ry	Eye Skin Breath Swallow	Immed Soap wash Immed Resp support Medical attention Immed	Liver, skin, CNS
[Tetrachloronaphthalene]							

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide No.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL, F.P., IP, Sp. Gr., flammability	VP, FRZ UEL, LEL		
Tetraethyl lead (as Pb) Pb(C ₂ H ₅) ₄ 78-00-2 TP4550000	Lead tetraethyl, TEL, Tetraethylplumbane	NIOSH/OSHA 0.075 mg/m ³ [skin]	40 mg/m ³ (as Pb)	Colorless liquid (unless dyed red, orange, or blue) with a pleasant, sweet odor [Note: Main usage is in anti-knock additives for gasoline.]	MW 323.5 BP 228°F (Decomposes) Sol: 0.00002% F.P. 200°F IP 11.10 eV	VP 0.2 mm FRZ -202°F UEL ? LEL 1.8%	Strong oxidizers, sulfuryl chloride, rust, potassium permanganate [Note: Decomposes slowly at room temperature and more rapidly at higher tempera- tures.]	XAD-2, Pentane, GC/PID, III [#2533]
1649 56	1 ppm = 13.45 mg/m ³				Sp Gr 1.65 Class IIIB Combustible Liquid			
Tetrahydrofuran C ₄ H ₈ O 109-99-8 LU5950000	Diethylene oxide, 1,4-Epoxybutane, Tetramethylene oxide, THF	NIOSH 200 ppm (590 mg/m ³) ST 250 ppm (735 mg/m ³) OSHA† 200 ppm (590 mg/m ³)	2000 ppm [LEL]	Colorless liquid with an ether-like odor	MW 72.1 BP 151°F Sol. Miscible F.P. 6°F IP 9.45 eV	VP 132 mm FRZ -163°F UEL 11.8% LEL 2%	Strong oxidizers, lithium-aluminum alloys [Note: Peroxides may accumulate upon prolonged storage in presence of air.]	Char. CS, GC/PID, III [#1609]
2056 26	1 ppm = 3.00 mg/m ³				Sp Gr 0.89 Class IB Flammable Liquid			
Tetramethyl lead (as Pb) Pb(CH ₃) ₄ 75-74-1 TP4725000	Lead tetramethyl, Tetramethylplumbane, TML	NIOSH/OSHA 0.075 mg/m ³ [skin]	40 mg/m ³ (as Pb)	Colorless liquid (unless dyed red, orange, or blue) with a fruity odor [Note: Main usage is in anti-knock additives for gasoline.]	MW 267.3 BP 212°F (Decomposes) Sol: 0.002% F.P. 100°F IP 8.50 eV	VP 23 mm FRZ -15°F UEL ? LEL ?	Strong oxidizers such as sulfuric chloride or potassium permanganate	XAD-2, Pentane, GC/PID, III [#2534]
1649 56	1 ppm = 11.11 mg/m ³				Sp Gr 2.00 Class II Combustible Liquid			
Tetramethyl succinonitrile (CH ₃) ₂ C(CN)C(CN)(CH ₃) ₂ 3333-52-6 WN4025000	Tetramethyl succino- dinitrile, TMSN	NIOSH/OSHA 3 mg/m ³ (0.5 ppm) [skin]	5 ppm	Colorless, odorless solid. [Note: Forms cyanide in the body.]	MW 136.2 BP Sublimes Sol. Insoluble F.P. ? IP ?	VP ? MLT 338°F (Sublimes) UEL ? LEL ?	Strong oxidizers	Char. CS, GC/PID, III(3) [#S155]
	1 ppm = 0.5 mg/m ³				Sp Gr 1.07 Combustible Solid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 6)	
Skin:	Prevent skin contact (>0.1%)	NIOSH/OSHA 0.75 mg/m ³ SA 1.875 mg/m ³ SA CF 3.75 mg/m ³ SAT CF/SCBAF/SAF 40 mg/m ³ SA PD PP § SCBAF PD PP/SAF PD PP ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Insom, lass, anxiety, tremor, hyper-reflexia, spasticity; bradycardia, hypotension; hypothermia; pallor, nau, anor, low-wgt, conf, disorientation, halo, psychosis, mania, convuls, coma, eye irrt	Eye: Skin: Breath: Swallow:	Irr, immed Soap wash immed Resp. support Medical attention immed	CNS, CVS, kidneys, eyes
Eyes:	Prevent eye contact						
Wash skin:	When contam (>0.1%)						
Remove:	When wet or contam (>0.1%)						
Change:	Daily						
Provide:	Quick drench (>0.1%)						
[Tetraethyl lead (as Pb)]							
Skin:	Prevent skin contact	NIOSH/OSHA 2000 ppm: SA: CF/CCRFOV/GMFOV/ PAPROV/SCBAF/SAF § SCBAF PD PP/SAF PD PP ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, upper resp sys, nau, dizz, head, CNS depre	Eye: Skin: Breath: Swallow:	Irr, immed Water flush prompt Resp. support Medical attention immed	Eyes, resp sys, CNS
Eyes:	Prevent eye contact						
Wash skin:	When contam						
Remove:	When wet (flam)						
Change:	N.R.						
[Tetrahydrofuran]							
Skin:	Prevent skin contact (>0.1%)	NIOSH/OSHA 0.75 mg/m ³ SA 1.875 mg/m ³ SA CF 3.75 mg/m ³ SAT CF/SCBAF/SAF 40 mg/m ³ SA PD PP § SCBAF PD PP/SAF PD PP ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Insom, bad dreams, restless, anxious, hypotension, nau, anor, delirium, mania, convuls, coma	Eye: Skin: Breath: Swallow:	Irr, immed Soap wash immed Resp. support Medical attention immed	CNS, CVS, kidneys
Eyes:	Prevent eye contact						
Wash skin:	When contam (>0.1%)						
Remove:	When wet or contam (>0.1%)						
Change:	Daily						
Provide:	Quick drench (>0.1%)						
[Tetramethyl lead (as Pb)]							
Skin:	Prevent skin contact	NIOSH/OSHA 28 mg/m ³ : SA/SCBAF § SCBAF PD PP/SAF PD PP ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Head, nau, convuls, coma, liver, kidney, GI effects	Eye: Skin: Breath: Swallow:	Irr, immed Soap wash prompt Resp. support Medical attention immed	CNS, liver, kidneys, GI tract
Eyes:	Prevent eye contact						
Wash skin:	When contam						
Remove:	When wet or contam						
Change:	Daily						

[Tetramethyl succinonitrile]

Chemical name, structure formula, CAS and RTECS Nos., and DOTID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL, Fl.P., IP, Sp. Gr., flammability	VP, FRZ, UEL, LEL		
Tetranitromethane $C(NO_2)_4$ 509-14-8 PB4025000	Tetan, TNM	NIOSH/OSHA 1 ppm (8 mg/m ³)	4 ppm	Colorless to pale-yellow liquid or solid (below 57°F) with a pungent odor.	MW: 196.0 BP: 259°F Sol: Insoluble Fl.P. ? IP: ?	VP: 8 mm FRZ: 57°F UEL: ? LEL: ?	Hydrocarbons, alkalis, metals, oxidizers, aluminum, toluene, cotton [Note: Combustible material wet with tetranitromethane may be highly explosive.]	Imp, none GC/Air-FID; II(3) [#S224]
1510 47	1 ppm = 8.15 mg/m ³				Sp Gr: 1.62 Combustible Liquid, but difficult to ignite			
Tetrasodium pyrophosphate $Na_4P_2O_7$ 7722-88-8 UX7350000	Pyrophosphate, Sodium pyrophosphate, Tetrasodium diphosphate, Tetrasodium pyrophosphate (anhydrous), TSPF	NIOSH 8 mg/m ³ OSHA† none	N.D.	Odorless, white powder or granules. [Note: The decahydrate ($Na_4P_2O_7 \cdot 10H_2O$) is in the form of colorless, transparent crystals.]	MW: 285.9 BP: Decomposes Sol(77°F): 7% Fl.P.: NA IP: NA	VP: 0 mm (approx) MLT: 1810°F UEL: NA LEL: NA	Strong acids	Filter; none; Grav; III [#0600, Reference Quat (total)]
Tetryl $(NO_2)_2C_6H_3N(NO_2)CH_3$ 479-45-8 BY6300000	N-Methyl-N-2,4,6-tetranitroaniline, Nitramine, 2,4,6-Tetryl, 2,4,6-Trinitrophenyl-N-methylnitramine	NIOSH/OSHA 1.5 mg/m ³ [skin]	750 mg/m ³	Colorless to yellow, odorless, crystalline solid.	MW: 287.2 BP: 356-374°F (Exploides) Sol: 0.02% Fl.P: Explosives IP: ?	VP: <1 mm MLT: 268°F UEL: ? LEL: ?	Oxidizable materials, hydrazine	Filter, Reagent, Vis. II(3) [#S225]
					Sp Gr: 1.57 Combustible Solid (Class A Explosive)			
Thallium (soluble compounds, as TI)	Synonyms vary depending upon the specific soluble thallium compound.	NIOSH/OSHA 0.1 mg/m ³ [skin]	15 mg/m ³ (as TI)	Appearance and odor vary depending upon the specific soluble thallium compound.	Properties vary depending upon the specific soluble thallium compound		Varies	Filter Acid, AAS; II(3) [#S306]

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 5)	Target organs (See Table 5)
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin, nose,	Eye:	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	4 ppm: SA: CF/ICRFS/IGMFSV	ing	throat, dizz, head, chest	Skin:	blood, CNS
Wash skin:	When contam	PAPRS/SCBAF/SAF	Con	pain dysp, methemo, cyan,	Breath:	
Remove:	When wet (flamm)	5 SCBAF PD, PP/SAF PD, PP, ASCBA		skin burns	Swallow:	
Change:	Daily	Escape GMFS/SCBAE				
Provide:	Eyewash					
[Tetranitromethane]						
Skin:	Prevent skin contact	TBAL	Inh	Irrit eyes, skin, nose,	Eye:	Eyes, skin, resp sys
Eyes:	Prevent eye contact		ing	throat, dermat	Skin:	
Wash skin:	When contam		Con		Swallow:	
Remove:	When wet or contam					
Change:	Daily					
Provide:	Eyewash (soln)					
[Tetrasodium pyrophosphate]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Sens derm, itch, eryt,	Eye:	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	7.5 mg/m ³ DM	Abs	edema on nasal folds,	Skin:	CNS, liver, kidneys
Wash skin:	When contam	15 mg/m ³ DMXSO ₂ /SA*	ing	cheeks, neck, kera,	Breath:	
Remove:	When wet or contam	37.5 mg/m ³ SA CF/PAPRDM*	Con	sneez; anemia, fig,	Swallow:	
Change:	Daily	75 mg/m ³ H ₂ F/SCBAF/SAF		cough, coryza, irrfly,		
		750 mg/m ³ SAF, PD, PP		mal head, less, mcom,		
		5 SCBAF PD, PP/SAF PD, PP, ASCBA		neu, vomit, liver, kidney		
		Escape H ₂ F/SCBAE		damage		
[Tetryl]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Nau, diarr, abdom pain,	Eye:	Eyes, resp sys, CNS,
Eyes:	Prevent eye contact	0.5 mg/m ³ DM*	Abs	vomit, ptosis, strabismus,	Skin:	liver, kidneys,
Wash skin:	When contam	1 mg/m ³ DMXSO ₂ /SA	ing	per, neuritis, tremor,	Breath:	GI tract, body
Remove:	When wet or contam	2.5 mg/m ³ SA CF/PAPRDM*	Con	reticler tight, chest pain,	Swallow:	hair
Change:	Daily	5 mg/m ³ H ₂ F/SAT CF/PAPRTH ₂ /SCBAF/SAF		pulm edema, sez, chorea,		
		15 mg/m ³ SAF, PD, PP		psychosis, liver, kidney		
		5 SCBAF PD, PP/SAF PD, PP, ASCBA		damage, alopecia, pares legs		
		Escape H ₂ F/SCBAE				
[Thallium (soluble compounds, as Tl)]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P., IP, Sp. Gr., flammability	VP, FRZ UEL, LEL		
4,4'-Thiobis(6-tert- butyl-m-cresol) [CH ₃ (OH)C ₆ H ₃ (CH ₃) ₂] ₂ S 98-69-5 GP3150900	4,4'-Thiobis(3-methyl- 6-tert-butylphenol); 1,1'-Thiobis(2-methyl- 4-hydroxy-5-tert- butylbenzene)	NIOSH 10 mg/m ³ (total) 5 mg/m ³ (resp) OSHA† 15 mg/m ³ (total) 5 mg/m ³ (resp)	N.D.	Light gray to tan powder with a slightly aromatic odor.	MW: 358.8 BP: ? Sol: 0.08% Fl.P: 420°F IP: ? Sp.Gr: 1.10 Combustible Solid	VP: 0.000006 mm MLT: 302°F UEL: NA LEL: NA	None reported	None available
Thioglycolic acid HSCH ₂ COOH 68-11-1 AI5950000 1940 60	Acetyl mercaptan, Mercaptoacetate, Mercaptoacetic acid, 2-Mercaptoacetic acid, Thiovanic acid	NIOSH 1 ppm (4 mg/m ³) [skin] OSHA† none	N.D.	Colorless liquid with a strong, disagreeable odor characteristic of mercaptans. [Note: Offactory fatigue may occur after short exposures.]	MW: 92.1 BP: ? Sol: Miscible Fl.P: >230°F IP: ? Sp.Gr: 1.32 Class IIIB Combustible Liquid	VP(84°F): 10mm FRZ: 21°F UEL: ? LEL: 5.9%	Air, strong oxidizers, bases, active metals [e.g., sodium potassium, magnesium, calcium] [Note: Readily oxidized by air.]	None available
Thionyl chloride SOCl ₂ 7719-09-7 XM5150000 1838 39	Sulfinyl chloride, Sulfur chloride oxide, Sulfurous dichloride, Sulfurous oxychloride, Thionyl dichloride	NIOSH C 1 ppm (5 mg/m ³) OSHA† none	N.D.	Colorless to yellow to reddish liquid with a pungent odor like sulfur dioxide. [Note: Fumes form when exposed to moist air.]	MW: 119.0 BP: 169°F Sol: Reacts Fl.P: NA IP: ? Sp.Gr: 1.64 Noncombustible Liquid	VP(70°F): 100mm FRZ: -156°F UEL: NA LEL: NA	Water, acids, alkalis, ammonia, chloryl perchlorate [Note: Reacts violently with water to form sulfur dioxide & hydrogen chloride.]	None available
Thiram C ₆ H ₈ N ₂ S ₂ 137-26-8 JO1400000	bis[Dimethyl(hiocarbonyl)] disulfide Tetramethylthiuram disulfide [(CH ₃) ₂ NC(S)SSC(S)N(CH ₃) ₂]	NIOSH/OSHA 5 mg/m ³	100 mg/m ³	Colorless to yellow crystalline solid with a characteristic odor [Note: Commercial pesticide products may be dyed blue]	MW 240.4 BP: Decomposes Sol: 0.003% Fl.P: ? IP: ? Sp.Gr: 1.29	VP: 0.000006 mm MLT 312°F UEL: ? LEL: ?	Strong oxidizers, strong acids, oxidizable materials	Filter, CH ₃ CN HP[C/UVD, III #5005]

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection -- maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 6)
Skin:	N.R.	TBAL	Inh Ing Con	Irrit eyes, skin, resp sys	Eye: Breath: Swallow: Irr immed Fresh air Medical attention Immed	Eyes, skin, resp sys
Eyes:	N.R.					
Wash skin:	N.R.					
Remove:	N.R.					
Change:	N.R.					
[4,4'-Thiobis(6-tert-butyl-m-cresol)]						
Skin:	Prevent skin contact	TBAL	Inh Abs Ing Con	Irrit eyes, skin, nose, throat; fac, com damage; skin burns, blisters; In animals: weak, gasping respirations; convulse	Eye: Skin: Breath: Swallow: Irr immed Water flush immed Resp support Medical attention Immed	Eyes, skin, resp sys
Eyes:	Prevent eye contact					
Wash skin:	When contam					
Remove:	When wet or contam					
Change:	N.R.					
Provide:	Eyewash, Quick drench					
[Thioglycolic acid]						
Skin:	Prevent skin contact	TBAL	Inh Ing Con	Irrit eyes, skin, muc memb; eye, skin burns	Eye: Skin: Breath: Swallow: Irr immed Water flush immed Resp support Medical attention Immed	Eyes, skin, resp sys
Eyes:	Prevent eye contact					
Wash skin:	When contam					
Remove:	When wet or contam					
Change:	N.R.					
Provide:	Eyewash, Quick drench					
[Thionyl chloride]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh Ing Con	Irrit eyes, skin, muc memb; derm. Antabuse-like effects	Eye: Skin: Breath: Swallow: Irr immed Soap wash prompt Resp support Medical attention Immed	Eyes, skin, resp sys CNS
Eyes:	Prevent eye contact	50 mg/m ³ CCRQVDMFu*/SA*				
Wash skin:	When contam	100 mg/m ³ SA, CF/CCRQVHIE/				
Remove:	When wet or contam	GMFOVHIE/PAPROVDMFu*/				
Change:	Daily	SCBAF/SAF				
		‡ SCBAF PD PP/SAF PD PP ASCBA				
		Escape GMFOVHIE/SCBAE				

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL F.P., IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Tin Sn 7440-31-5 XP7320000	Metals: tin, Tin flakes Tin metal Tin powder	NIOSH* OSHA* 2 mg/m ³ [*Note: The REL and PEL also apply to other inorganic tin compounds (as Sn) except tin oxides.]	100 mg/m ³ (as Sn)	Gray to almost silver-white, ductile, malleable, lustrous solid	MW 118.7 BP 454.5°F Sol: Insoluble F.P.: NA IP: NA	VP 0 mm (approx) MLT: 449°F UEL: NA LEL: NA	Chlorine, turpentine, acids, alkalis	Filter: Acid; AAS; II(3) [#S183]
					Sp Gr: 7.28 Noncombustible Solid, but powdered form may ignite			
Tin (organic compounds, as Sn)	Synonyms vary depending upon the specific organic tin compound [Note: Also see specific listing for Cyhexatin.]	NIOSH* 0.1 mg/m ³ [skn] [*Note: The REL applies to all organic tin compounds except cyhexatin.] OSHA† 0.1 mg/m ³	25 mg/m ³ (as Sn)	Appearance and odor vary depending upon the specific organic tin compound.	Properties vary depending upon the specific organic tin compound		Varies	Filter/ XAD-2; HPLC; AAS; III [#5504]
Tin(II) oxide (as Sn) SnO 21651-19-4	Stannous oxide, Tin protoxide [Note: Also see specific listing for Tin(IV) oxide (as Sn).]	NIOSH 2 mg/m ³ OSHA† none	N.D.	Brownish-black powder.	MW: 134.7 BP: Decomposes Sol: Insoluble F.P.: NA IP: NA	VP: 0 mm (approx) MLT(500 mmHg): 1976°F (Decomposes) UEL: NA LEL: NA	None reported	Filter; Acids; ICP; II [#7300, Elements]
					Sp.Gr: 6.3			
Tin(IV) oxide (as Sn) SnO ₂ 18282-10-6 XQ4000000	Stannic dioxide, Stannic oxide, White tin oxide [Note: Also see specific listing for Tin(II) oxide (as Sn).]	NIOSH 2 mg/m ³ OSHA† none	N.D.	White or slightly gray powder.	MW: 150.7 BP: Decomposes Sol: Insoluble F.P.: NA IP: NA	VP: 0 mm (approx) MLT: 2966°F (Decomposes) UEL: ? LEL: ?	Chlorine trifluoride	Filter; Acids; ICP; III [#7300, Elements]
					Sp.Gr: 6.95			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	N.R.	NIOSH/OSHA	Inh	Irrit eyes, skin, resp	Eye	Eyes, skin, resp
Eyes:	N.R.	10 mg/m ³ DM*	Con	sys	Soap wash immed	sys
Wash skin:	N.R.	20 mg/m ³ DMXSO**/SA*		In animals: vomit, diarr,	Breath	
Remove:	N.R.	50 mg/m ³ SA CF*/PAPRDM**		para with musc twitch	Swallow	
Change:	N.R.	100 mg/m ³ H/EF/SCBAF/SAF				
		§ SCBAF PD PP/SAF PD PP ASCBA				
		Escape H/EF/SCBAE				

[Tin]

Recommendations vary depending upon the specific compound.	NIOSH/OSHA 1 mg/m ³ CCROVDM/SA 2.5 mg/m ³ SA CF/PAPROVDM 5 mg/m ³ CCRFOVH/E/GMFOVH/E/ PAPRFOVH/E/SAT CF/ SCBAF/SAF 25 mg/m ³ SAF/PD,PP § SCBAF PD PP/SAF PD PP ASCBA Escape GMFOVH/E/SCBAE	Inh Abs Ing Con	Irrit eyes, skin; resp sys; head vert, psycho- neurologic dist, sore throat, cough, abdom pain, vomit, urine retention, paresis, local anes, skin burns, pruritus, in animals: hemolysis, hepatic nec, kidney damage	Eye: Skin: Breath: Swallow	Irrimmed Water flush immed Resp support Medical attention immed	Eyes, skin, resp sys, CNS, liver, kidneys, urinary tract, blood
--	--	--------------------------	--	-------------------------------------	---	---

[Tin (organic compounds, as Sn)]

Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.	TBAL	Inh Con	Stannosis (benign pneumoconiosis); dysp, decr pulm func	Eye: Breath:	Irrimmed Fresh air	Resp sys
---	------	------------	---	-----------------	-----------------------	----------

[Tin(II) oxide (as Sn)]

Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.	TBAL	Inh Con	Stannosis (benign pneumoconiosis); dysp, decr pulm func	Eye: Breath:	Irrimmed Fresh air	Resp sys
---	------	------------	---	-----------------	-----------------------	----------

[Tin(IV) oxide (as Sn)]

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TLWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl, P, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Titanium dioxide TiO ₂ 13463-67-7 XR2275000	Rutile Titanium oxide Titanium peroxide	NIOSH Ca See Appendix A OSHA† 15mg/m ³	Ca [5000 mg/m ³]	White odorless powder	MW 79.9 BP 4532- 5432°F Sol Insoluble Fl: P: NA IP: NA	VP 0 mm (approx) MLT: 3326- 3362°F UEL: NA LEL: NA	None reported	Filer; Acid AAS; IR-31 [#S385]
					Sp Gr 4.26 Noncombustible Solid			
o-Tolidine C ₁₀ H ₉ N ₃ 119-93-7 DD1225000	4,4'-Diamino-3,3'-dimethyl- biphenyl; Diaminodiphenyl; 3,3'-Dimethylbenzidine; 3,3'-Dimethyl-4,4'-diphenyl- diamine; 3,3'-Tolidine [CH ₃ (NH ₂)C ₆ H ₄ C ₆ H ₃ (NH ₂)CH ₃]	NIOSH Ca See Appendix A See Appendix C C 0.02 mg/m ³ [60-min] (skin) OSHA See Appendix C	Ca [N.D.]	White to reddish crystals or powder. [Note: Darkens on exposure to air. Often used in paste or wet cake form. Used as a basis for many dyes.]	MW: 212.3 BP: 572°F Sol: 0.1% Fl: P: ? IP: ? Sp Gr: ? Combustible Solid	VP: ? MLT: 264°F UEL: 7 LEL: ?	Strong oxidizers	Filer; water; HPLC/UVD; IR [#5013, Dyes]
Toluene C ₇ H ₈ CH ₃ 108-68-3 XS5250000	Methyl benzene; Methyl benzo; Phenyl methane; Toluol	NIOSH 100 ppm (375 mg/m ³) ST 150 ppm (560 mg/m ³) OSHA† 200 ppm C 300 ppm 500 ppm (10-min max peak)	500 ppm	Colorless liquid with a sweet pungent, benzene- like odor	MW 92.1 BP 232°F Sol (74°F): 0.07% Fl P: 40°F IP 8.82 eV	VP 21 mm FRZ -139°F UEL 7.1% LEL 1.1%	Strong oxidizers	Char; CS; GC/IR; IR [#1500 Hydro- carbons]
1294 27	1 ppm = 3.83 mg/m ³				Sp Gr 0.87 Class IB Flammable Liquid			
Toluenediamine CH ₃ C ₆ H ₄ (NH ₂) ₂ 25376-45-8 95-80-7 (2,4-TDA) XS9445000 XS9625000 (2,4-TDA)	Diaminotoluene, Methylphenylenediamine, TDA, Toluylenediamine	NIOSH Ca (all isomers) See Appendix A OSHA none	Ca [N.D.]	Colorless to brown, needle-shaped crystals or powder. [Note: Tends to darken on storage & exposure to air. Properties given are for 2,4-TDA.]	MW: 122.2 BP: 558°F Sol: Soluble Fl P: 300°F IP: ? Sp Gr 1.026 (at 212°F)	VP (224°F): 1 mm MLT: 210°F UEL: ? LEL: ?	None reported	Imp; Reagent; HPLC/UVD; IR [#5516]

Personal protection and sanitation (See Table 3)	Recommendations for respirator selection—maximum concentration for use (MUC) (See Table 4)	Health hazards			
		Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 6)
Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: Daily	NIOSH § SCBAF PD PP/SAF PD,PP ASCBA Escape: HIEF/SCBAE	Inh	Lung fib. [canc]	Breath Resp support	Resp sys [in animals: lung tumors]
[Titanium dioxide]					
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam/Daily Remove: When wet or contam Change: Daily Provide: Eyewash, Quick drench	NIOSH § SCBAF PD,PP/SAF PD,PP/ASCBA Escape: GMFOVHIE/SCBAE	Inh Abs Ing Con	Irrit eyes, nose; in animals: liver, kidney damage; [canc]	Eye: Skin: Breath: Swallow: Immed Soap flush immed Resp support Medical attention	Eyes, resp sys, liver, kidneys [in animals: liver, bladder & mammary gland tumors]
[o-Tolidine]					
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flam) Change: N.R.	NIOSH 500 ppm: CCROV*/PAPROV*/GMFOV/ SA*/SCBAF § SCBAF PD PP/SAF PD,PP ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, nose; fg weak, conf euph dizz, head, dilated pupils, lac. ner, musc/fg, insem, pares, derm, liver, kidney damage	Eye Skin Breath Swallow Immed Soap wash prompt Resp support Medical attention	Eyes, skin, resp sys, CNS, liver, kidneys
[Toluene]					
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam/Daily Remove: When wet or contam Change: Daily Provide: Eyewash, Quick drench	NIOSH § SCBAF PD,PP/SAF PD,PP/ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, skin, nose, throat; derm; ataxia, tacer, naus, vomit, convuls, resp depress, methemo, cyan, head, fg, dizz, bluish skin; liver inj; [canc]	Eye: Skin: Breath: Swallow: Immed Water flush immed Resp support Medical attention	Eyes, skin, resp sys, blood, CVS, liver, CNS [in animals: liver, skin & mammary gland tumors]
[Toluenediamine]					

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TLV unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL F.P., IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Toluene-2,4- diisocyanate <chem>CH3C6H3(NCO)2</chem> 584-84-9 C26300000	TDI 2,4-TDI 2,4-Toluene diisocyanate	NIOSH Ca See Appendix A OSHA† C 0.02 ppm (0.14 mg/m³)	Ca [2.5 ppm]	Colorless to pale- yellow solid or liquid (above 71°F) with a sharp, pungent odor	MW 174.2 BP 484°F Sol insoluble F.P. 260°F IP ?	VP(77°F): 0.06 mm MLT 71°F UEL 9.5% LEL 0.9%	Strong oxidizers, water, acids, bases & amines (may cause foam & spatter); alcohols [Note: Reacts slowly with water to form carbon dioxide and polyureas]	Coated glass wool, Methanol, HPLC/UVD: III [#2535]
2078 57	1 ppm = 7.24 mg/m³				Sp Gr 1.22 Class IIIB Combustible Liquid			
o-Toluidine <chem>CH3C6H4NH2</chem> 95-53-4 XU2975000	o-Aminotoluene, 2-Aminotoluene, 1-Methyl-2-aminobenzene, o-Methylaniline, 2-Methylaniline, ortho-Toluidine	NIOSH Ca See Appendix A [skin] OSHA 5 ppm (22 mg/m³) [skin]	Ca [50 ppm]	Colorless to pale- yellow liquid with an aromatic, aniline-like odor.	MW 107.2 BP 392°F Sol 2% F.P. 185°F IP: 7.44 eV	VP 0.3 mm FRZ 6°F UEL ? LEL ?	Strong oxidizers, nitric acid, bases	Sig el, Ethanol, GC/FID, II [#2002, Aromatic Amines]
1708 55	1 ppm = 4.46 mg/m³				Sp Gr 1.01 Class IIIA Combustible Liquid			
m-Toluidine <chem>CH3C6H4NH2</chem> 108-44-1 XU2800000	3-Amino-1-methylbenzene, 1-Aminophenylmethane, m-Aminotoluene, 3-Methylaniline, 3-Methylbenzenesamine, 3-Toluidine, m-Tolylamine	NIOSH See Appendix D OSHA† none	N.D.	Colorless to light- yellow liquid with an aromatic, amine- like odor. [Note: Used as a basis for many dyes.]	MW: 107.2 BP: 397°F Sol: 2% F.P.: 187°F IP: 7.50 eV	VP(108°F): 1 mm FRZ: -23°F UEL: ? LEL: ?	Oxidizers, acids	Sig el; Ethanol; GC/FID; II [#2002, Aromatic Amines]
1708 58	1 ppm = 4.46 mg/m³				Sp.Gr: 0.999 Class IIIA Combustible Liquid			
p-Toluidine <chem>CH3C6H4NH2</chem> 106-49-0 XU3150000	4-Aminotoluene, 4-Methylaniline, 4-Methylbenzenamine, 4-Toluidine, Tolylamine	NIOSH Ca See Appendix A OSHA† none	Ca [N.D.]	White solid with an aromatic odor. [Note: Used as a basis for many dyes.]	MW: 107.2 BP: 393°F Sol: 0.7% F.P.: 188°F IP: 7.50 eV	VP(108°F): 1 mm MLT: 111°F UEL: ? LEL: ?	Oxidizers, acids	Sig el; Ethanol; GC/FID; II [#2002, Aromatic Amines]
1708 58	1 ppm = 4.46 mg/m³				Sp.Gr: 1.06 Combustible Solid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam/Daily Remove: When wet or contam Change: Daily Provide: Eyewash, Quick drench		NIOSH # SCBAF PD PP/SAF PD,PP ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, skin, nose, throat, choke, paroxysmal cough, chest pain, retractor soreness, nau, vomit, abdomen pain, bron, bronchoepaem, pain edema, dysp, asthma, con, lac, derm, skin sens. [canc]	Eye: Skin Breath: Swallow Irr immed Soap wash immed Resp support Medical attention immed	Eyes, skin, resp sys (in animals: pancreas, liver, mammary gland, circulatory sys & skin tumors)
[Toluene-2,4-diisocyanate]						
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R. Provide: Eyewash, Quick drench		NIOSH # SCBAF PD PP/SAF PD,PP ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes; anoxia, head, cyan, weak, dizz, drow, microhema, eyeburns, derm. [canc]	Eye: Skin Breath: Swallow Irr immed Soap wash immed Resp support Medical attention immed	Eyes skin blood kidneys liver, CVS (in animals: liver, bladder & mammary gland tumors)
[o-Toluidine]						
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R.		TBAL	Inh Abs Ing Con	Irrit eyes, skin; hema, methemo; cyan, nau, vomit, low BP, convuls; anemia, weak	Eye: Skin Breath: Swallow Irr immed Soap wash immed Resp support Medical attention immed	Eyes, skin, blood CVS
[m-Toluidine]						
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam/Daily Remove: When wet or contam Change: Daily Provide: Eyewash, Quick drench		NIOSH # SCBAF PD,PP/SAF PD,PP ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, skin; derm; hema, methemo; cyan, nau, vomit, low BP, convuls; anemia, weak; [canc]	Eye: Skin Breath: Swallow Irr immed Soap wash immed Resp support Medical attention immed	Eyes, skin, blood, CVS (in animals: liver tumors)
[p-Toluidine]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TYWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL F.P., IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Tributyl phosphate (CH ₃) ₃ CH ₂ (O) ₂ PO 126-73-8 TC7700000	Butyl phosphate, TBP, Tributyl ester of phosphoric acid Tri-n-butyl phosphate	NIOSH 0.2 ppm (2.5 mg/m ³) OSHA† 5 mg/m ³	30 ppm	Colorless to pale- yellow, odorless liquid	MW: 266.3 BP: 552°F (Decomposes) Sol: 0.6% F.P.(oc): 295°F IP: ?	VP(77°F): 0.004 mm FRZ: -112°F UEL: ? LEL: ?	Alkalis, oxidizers, water, moist air	Filter; Diethyl ether; GC/FPD; IR [#S208]
	1 ppm = 11.07 mg/m ³				Sp Gr: 0.98 Class IIIB Combustible Liquid			
Trichloroacetic acid CCl ₃ COOH 78-03-8 AJ7878000	TCA, Trichloroethanoic acid	NIOSH 1 ppm (7 mg/m ³) OSHA† none	N.D.	Colorless to white, crystalline solid with a sharp, pungent odor.	MW: 163.4 BP: 388°F Sol: Miscible F.P.: NA IP: ?	VP(124°F): 1 mm MLT: 136°F UEL: NA LEL: NA	Moisture, iron, zinc, aluminum, strong oxidizers [Note: Decomposes on heating to form phosgene & hydrogen chloride. Corrosive to metals.]	None available
1838-88 (solid) 2884-88 (solution)	1 ppm = 8.79 mg/m ³				Sp Gr: 1.42 Noncombustible Solid			
1,2,4-Trichlorobenzene C ₆ H ₃ Cl ₃ 120-82-1 OC2100000none	unsym-Trichlorobenzene; 1,2,4-Trichlorobenzol	NIOSH C 6 ppm (40 mg/m ³) OSHA† —	N.D.	Colorless liquid or crystalline solid with a sharp aromatic odor. 2.6%	MW: 181.4 BP: 416°F Sol: 0.003% F.P.: 222°F IP: ?	VP: 1 mm FRZ: 63°F UEL(302°F): 6.6% LEL(302°F): —	Acids, acid fumes, oxidizers, steam	Filter; XAD-2; Hexane; GC/ECD; IR [#S517, Poly- chloro- benzenes]
2321-84 (liquid)	1 ppm = 7.64 mg/m ³				Sp Gr: 1.45 Class IIIB Combustible Liquid Combustible Solid			
1,1,2-Trichloroethane CHCl ₂ CH ₂ Cl 79-00-5 KJ3150000	Ethane trichloride, β-Trichloroethane, Vinyl trichloride	NIOSH Ca See Appendix A See Appendix C (Chloroethane) 10 ppm (45 mg/m ³) [skin] OSHA 10 ppm (45 mg/m ³) [skin]	Ca [100 ppm]	Colorless liquid with a sweet, chloroform-like odor	MW: 133.4 BP: 237°F Sol: 0.4% F.P.: ? IP: 11.00 eV	VP 19 mm FRZ: -34°F UEL 15.9% LEL 6%	Strong oxidizers & caustics chemically active metals (such as aluminum, magnesium powders, sodium & potassium)	Char; CS; C/FID; IR [#1003, Halo- genated Hydro- carbons]
2831-74	1 ppm = 5.55 mg/m ³				Sp Gr: 1.44 Combustible Liquid, forms dense soot			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, skin, resp sys.	Eye	Eyes, skin, resp sys
Eyes:	Prevent eye contact	2 ppm SA	Ing	head, nau	Skin	
Wash skin:	When contam	5 ppm SA CF	Con		Breath	
Remove:	When wet or contam	10 ppm SCBAF/SAF			Swallow	
Change:	N.R.	30 ppm SAF PD, PP				
		5 SCBAF PD PP/SAF PD PP ASCBA				
		Escape GMFOVHE/SCBAE				
[Tributyl phosphite]						
Skin:	Prevent skin contact	TBAL	Inh	Irrit eyes, skin, nose,	Eye:	Eyes, skin, resp sys,
Eyes:	Prevent eye contact		Ing	throat, resp sys; cough,	Skin:	GI tract
Wash skin:	When contam		Con	dysp, delayed pulm edema;	Breath:	
Remove:	When wet or contam			eye, skin burns, derm;	Swallow:	
Change:	Daily			saliv, vomit, diar		
Provide:	Eyewash, Quick drench					
[Trichloroacetic acid]						
Skin:	Prevent skin contact	TBAL	Inh	Irrit eyes, skin, muc memb;	Eye:	Eyes, skin, resp sys,
Eyes:	Prevent eye contact		Abs	in animals: liver, kidney	Skin:	liver, repro sys
Wash skin:	When contam		Ing	damage; possible terato	Breath:	
Remove:	When wet or contam		Con	effects	Swallow:	
Change:	N.R.					
[1,2,4-Trichlorobenzene]						
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, nose, CNS	Eye	Eyes, resp sys, CNS,
Eyes:	Prevent eye contact	5 SCBAF PD PP/SAF PD PP ASCBA	Abs	depress liver, kidney	Skin	liver, kidneys
Wash skin:	When contam	Escape GMFOV/SCBAE	Ing	damage, derm; [carc]	Breath	[in animals,
Remove:	When wet or contam		Con		Swallow	liver cancer]
Change:	N.R.					
Provide:	Eyewash, Quick drench					

[1,1,2-Trichloroethane]

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TLV unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL, Fl.P., IP, Sp. Gr., flammability	VP, FRZ UEL, LEL		
Trichloroethylene ClCH=CCl_2 79-01-6 KX4550000	Ethylene trichloride, TCE, Trichloroethene, Trilene	NIOSH Ca See Appendix A See Appendix C OSHA† 100 ppm C 200 ppm 300 ppm (8-min max peak in any 2 hrs)	Ca [1000 ppm]	Colorless liquid (unless dyed blue) with a chloroform- like odor.	MW 131.4 BP 189°F SOL 77°F: 0.0001% Fl.P. ? IP 9.45 eV	VP 58 mm FRZ -99°F UEL(77°F): 105% LEL(77°F): 8%	Strong caustics & alkalis chemically- active metals (such as barium, lithium, sodium, magnesium, titanium & beryllium)	Char. CS, GC/FID, III [#1022]
1710 74	1 ppm = 5.46 mg/m ³				Sp Gr 1.46 Combustible Liquid, but burns with difficulty			
Trichloronaphthalene $\text{C}_{10}\text{H}_7\text{Cl}_3$ 1321-65-9 QK4025000	Halowax® Nibren wax Sneekay wax	NIOSH/OSHA 5 mg/m ³ [skin]	Unknown	Colorless to pale- yellow solid with an aromatic odor	MW 231.5 BP 579-669°F Sol Insoluble Fl (oc) 392°F IP ?	VP <1 mm MLT 199°F UEL ? LEL ?	Strong oxidizers	Filter/Bub. none GC/FID, II(2) [#128]
					Sp Gr 1.58 Combustible Solid			
1,2,3-Trichloropropane $\text{CH}_2\text{ClCHClCH}_2\text{Cl}$ 96-18-4 T29275000	Allyl trichloride, Glycerol trichlorohydrin, Glyceryl trichlorohydrin, Trichlorohydrin	NIOSH Ca See Appendix A 10 ppm (60 mg/m ³) [skin] OSHA† 50 ppm (300 mg/m ³)	Ca [100 ppm]	Colorless liquid with a chloroform- like odor	MW 147.4 BP 314°F Sol 0.1% Fl.P. 180°F IP ?	VP: 3 mm FRZ 6°F UEL(302°F): 12.8% LEL(240°F): 3.2%	Chemically-active metals strong caustics & oxidizers	Char. CS, GC/FID, III [#1003, Halo- genated Hydro- carbons]
	1 ppm = 6.13 mg/m ³				Sp Gr 1.39 Class IIA Combustible Liquid			
1,1,2-Trichloro-1,2,2- trifluoroethane $\text{CCl}_2\text{FCClF}_2$ 76-13-1 KJ4000000	Chlorofluorocarbon-113, CFC-113, Freon® 113, Genetron® 113, Halocarbon 113, Refrigerant 113, TTE	NIOSH 1000 ppm (7600 mg/m ³) ST 1250 ppm (9500 mg/m ³) OSHA† 1000 ppm (7600 mg/m ³)	2000 ppm	Colorless to water-white liquid with an odor like carbon tetrachloride at high concentra- tions [Note: A gas above 118°F]	MW 187.4 BP 118°F Sol(77°F): 0.02% Fl.P. ? IP 11.99 eV	VP 285 mm FRZ -31°F UEL ? LEL ?	Chemically-active metals such as calcium, powdered aluminum, zinc, magnesium & beryllium [Note: Decomposes if in contact with alloys containing >2% magnesium]	Char. CS, GC/FID, III [#1020]
	1 ppm = 7.79 mg/m ³				Sp Gr(77°F) 1.56 Noncombustible - liquid at ordinary temperatures, but the gas is flammable and burn weakly at 1256°F.			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 6)
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam. Remove: When wet or contam. Change: N.R. Provide: Eyewash, Quick drench	NIOSH & SCBAF PD PP/SAF PD PP ASCBA Escape GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, skin; head, vert., vis. dist., itg., gidd., tremor, som. nau., vomit, derm., card. arrhy., pares., liver inj.; [canc.]	Eye: Skin: Breath: Swallow:	Irrimmed Soap wash prompt Resp. support Medical attention immed	Eyes, skin, resp. sys., heart, liver, CNS [in animals: liver & kidney cancer]
[Trichloroethylene]						
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam. Remove: When wet or contam. Change: Daily	NIOSH/OSHA 50 mg/m ³ SCBAF/SAF & SCBAF PD PP/SAF PD PP ASCBA Escape GMFOVHIE/SCBAE	Inh Abs Ing Con	Anor., nau., vert., jaun., liver inj.	Eye Skin Breath: Swallow:	Irrimmed Soap wash Resp. support Medical attention immed	Liver
[Trichloronaphthalene]						
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam. Remove: When wet or contam. Change: N.R. Provide: Eyewash, Quick drench	NIOSH & SCBAF PD PP/SAF PD PP ASCBA Escape GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, nose, throat, CNS depress., in animals: liver, kidney inj. [canc.]	Eye Skin Breath: Swallow:	Irrimmed Soap wash Resp. support Medical attention immed	Eyes, skin, resp. sys., CNS, liver, kidneys [in animals: forelimbs, liver & mammary gland cancer]
[1,2,3-Trichloropropane]						
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam. Remove: When wet or contam. Change: N.R.	NIOSH/OSHA 2000 ppm: SA/SCBAF & SCBAF PD PP/SAF PD PP ASCBA Escape GMFOV/SCBAE	Inh Ing Con	Irrit skin, throat, slow derm., CNS depress.; in animals: card. arrhy., narcosis	Eye Skin Breath: Swallow:	Irrimmed Soap wash prompt Resp. support Medical attention immed	Skin, heart, CNS, CVS
[1,1,2-Trichloro-1,2,2-trifluoroethane]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, Flammability	VP, FRZ UEL, LEL		
Trimethylamine (C ₃ H ₉) ₃ N 121-44-8 YEO175000	TEA	NIOSH See Appendix D OSHA† 25 ppm (100 mg/m ³)	200 ppm	Colorless liquid with a strong, ammonia-like odor.	MW 101.2 BP 193°F Sol: 2% FLP: 20°F IP: 7.50 eV	VP: 54 mm FRZ: -175°F UEL: 8.0% LEL: 1.2%	Strong oxidizers, strong acids, chlorine, hypochlorite, halogenated compounds	Bub. NaOH; GC/FID; IR(3) [#5152]
1296 68	1 ppm = 4.21 mg/m ³				Sp Gr: 0.73 Class IB Flammable Liquid			
Trifluorobromomethane CBrF ₃ 75-63-8 PA5425000	Bromotrifluoromethane, Fluorocarbon 1301, Freon® 13B1, Halocarbon 13B1, Halon® 1301, Monobromotrifluoromethane, Ratigant 13B1, Trifluoromonobromomethane	NIOSH/OSHA 1000 ppm (6100 mg/m ³)	40,000 ppm	Colorless, odorless gas [Note: Shipped as a liquefied compressed gas.]	MW 148.9 BP -72°F Sol: 0.03% FLP: NA IP: 11.78 eV	VP: >1 atm FRZ: -267°F UEL: NA LEL: NA	Chemically-active metals (such as calcium, powdered aluminum, zinc & magnesium)	Char(2); CH ₂ Cl; GC/FID; IR [#1017]
1009 12	1 ppm = 6.19 mg/m ³				RGasD: 5.14 Nonflammable Gas			
Trimellitic anhydride C ₁₀ H ₄ O ₅ 552-30-7 DC2050000	1,2,4-Benzene tricarbonylic anhydride; 4-Carboxyphthalic anhydride; TMAA; TMAH; Trimellitic acid anhydride [Note: TMA is also a synonym for Trimethylamine.]	NIOSH 0.005 ppm (0.04 mg/m ³) Should be handled in the workplace as an extremely toxic substance. OSHA† none	N.D.	Colorless solid.	MW: 192.1 BP: 7 Sol: 7 FLP: NA IP: 7	VP: 0.000004 mm MLT: 322°F UEL: NA LEL: NA	None reported	Filter; Methanol; GC/FID; IR [P&CAM #322]
Trimethylamine (CH ₃) ₃ N 75-50-3 PA630000	N,N-Dimethylmethanamine; TMA [Note: May be used in an aqueous solution (typically 25%, 30%, or 40% TMA.)]	NIOSH 15 ppm (24 mg/m ³) ST 15 ppm (24 mg/m ³) OSHA† none	N.D.	Colorless gas with a fishy, amine odor. [Note: A liquid below 37°F, shipped as a liquefied compressed gas.]	MW: 59.1 BP: 37°F Sol: 1454 mm FLP: NA (Gas 20°F (Liq)) IP: 7.82 eV	VP(70°F): 1454 mm FRZ: -179°F UEL: 11.8% LEL: 2.0%	Strong oxidizers (including bromine), ethylene oxide, nitrosating agents (e.g., sodium nitrite), mercury, strong acids [Note: Corrosive to many metals (e.g., zinc, brass, aluminum, copper).]	None available
1083 19 (inhy. liq.) 1297 79 (aqueous)	1 ppm = 2.46 mg/m ³				RGasD: 2.09 Flammable Gas Class 1A Flammable Liquid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 6)
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet (flamm) N.R. Eyewash (>1%), Quick drench (>1%)	OSHA 200 ppm: SA:CF/SCBAF/SAF § SCBAF PD,PP/SAF PD,PP ASCBA Escape: GMFS/SCBAE	Inh Abs Ing Con	Irrit eyes, skin, resp sys, in animals: myocardial, kidney, liver damage	Eye: Skin: Breath: Swallow: Irr immed Soap wash immed Resp support Medical attention immed	Eyes, skin, resp sys, CVS, liver, kidneys
[Trimethylamine]						
Skin: Eyes: Wash skin: Remove: Change: Provide:	Frostbite Frostbite N.R. N.R. Frostbite	NIOSH/OSHA 10,000 ppm: SA 25,000 ppm: SA CF 40,000 ppm: SAT:CF/SCBAF/SAF § SCBAF PD,PP/SAF PD,PP ASCBA Escape: GMFOV/SCBAE	Inh Con (liq)	LI-head, card arrhy, liq: frostbite	Eye: Skin: Breath: Frostbite Frostbite Resp support	CNS, heart
[Trifluorobromomethane]						
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam When wet or contam Daily	TBAL	Inh Ing Con	Irrit eyes, skin, nose, resp sys; pulm edema, resp sens; rhinitis, asthma, cough, wheez, dysp, mal, fever, muscle aches, sneez	Eye: Skin: Breath: Swallow: Irr immed Soap wash Resp support Medical attention immed	Eyes, skin, resp sys
[Trimethylsilyl anhydride]						
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact (liq/soln) Frostbite Prevent eye contact (liq/soln)/Frostbite When contam (soln) When wet (flamm) N.R. Eyewash (liq/soln), Quick drench (liq/soln), Frostbite	TBAL	Inh Ing (soln) Con	Irrit eyes, skin, nose, throat, resp sys; cough, dysp, delayed pulm edema; blurred vision, corn nec; skin burns; liq: frostbite	Eye: Skin: Breath: Swallow: Irr immed (liq/soln) Frostbite Water flush immed (liq/soln)/Frostbite Resp support Medical attention immed (soln)	Eyes, skin, resp sys
[Trimethylamine]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL F.P., IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
1,2,3-Trimethylbenzene $C_9H_{12}(CH_3)_3$ 526-73-8 DC3300000	Hemellitrol [Note: Hemimellitane is a mixture of the 1,2,3-isomer with up to 10% of related aromatics such as the 1,2,4-isomer.]	NIOSH 25 ppm (125 mg/m ³) OSHA† none	N.D.	Clear, colorless liquid with a distinctive, aromatic odor.	MW: 120.2 BP: 349°F Sol: Low F.P.: 7 IP: 8.68 eV Sp.Gr: 0.89 Flammable Liquid	VP(62°F): 1 mm FRZ: -14°F UEL: 6.6% LEL: 0.8%	Oxidizers, nitric acid	None available
2326 26 1,2,4-Trimethylbenzene $C_9H_{12}(CH_3)_3$ 95-63-8 DC3326000	Asymmetrical trimethyl- benzene, psi-Cumene, Pseudocumene [Note: Hemimellitane is a mixture of the 1,2,3-isomer with up to 10% of related aromatics such as the 1,2,4-isomer.]	NIOSH 25 ppm (125 mg/m ³) OSHA† none	N.D.	Clear, colorless liquid with a distinctive, aromatic odor.	MW: 120.2 BP: 337°F Sol: 0.006% F.P.: 112°F IP: 8.27 eV Sp.Gr: 0.88 Class II Flammable Liquid	VP(56°F): 1 mm FRZ: -77°F UEL: 6.4% LEL: 0.9%	Oxidizers, nitric acid	None available
2326 26 1,3,5-Trimethylbenzene $C_9H_{12}(CH_3)_3$ 108-87-8 OX6825000	Mesitylene, Symmetrical trimethyl- benzene, sym-Trimethylbenzene	NIOSH 25 ppm (125 mg/m ³) OSHA† none	N.D.	Clear, colorless liquid with a distinctive, aromatic odor.	MW: 120.2 BP: 329°F Sol: 0.002% F.P.: 122°F IP: 8.39 eV Sp.Gr: 0.86 Class II Flammable Liquid	VP: 2 mm FRZ: -49°F UEL: 7 LEL: 7	Oxidizers, nitric acid	None available
2326 26 Trimethyl phosphite $(CH_3O)_3P$ 121-45-9 TH1400000	Methyl phosphite, Trimethoxyphosphine	NIOSH 2 ppm (10 mg/m ³) OSHA† none	N.D.	Colorless liquid with a distinctive, pungent odor.	MW: 124.1 BP: 232°F Sol: Reacts F.P.: 82°F IP: 7 Sp.Gr: 1.21 Class II Flammable Liquid	VP(77°F): 24 mm FRZ: -108°F UEL: 7 LEL: 7	Magnesium perchlorate, None water [Note: Reacts (hydrolyzes) with water.]	None available

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 8)	Target organs (See Table 5)
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R.		TBAL	Inh Ing Con	Irrit eyes, skin, nose, throat, resp sys, bron; hypochromic anemia, head, drow, fig, dizz, nau, inco; vomit, conf; chemical pneu (aspiriq)	Eye: Irr irritated Skin: Soap wash Breath: Resp support Swallow: Medical attention Irritated	Eyes, skin, resp sys, CNS, blood
[1,2,3-Trimethylbenzene]						
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R.		TBAL	Inh Ing Con	Irrit eyes, skin, nose, throat, resp sys, bron; hypochromic anemia, head, drow, fig, dizz, nau, inco; vomit, conf; chemical pneu (aspiriq)	Eye: Irr irritated Skin: Soap wash Breath: Resp support Swallow: Medical attention Irritated	Eyes, skin, resp sys, CNS, blood
[1,2,4-Trimethylbenzene]						
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R.		TBAL	Inh Ing Con	Irrit eyes, skin, nose, throat, resp sys, bron; hypochromic anemia, head, drow, fig, dizz, nau, inco; vomit, conf; chemical pneu (aspiriq)	Eye: Irr irritated Skin: Soap wash Breath: Resp support Swallow: Medical attention Irritated	Eyes, skin, resp sys, CNS, blood
[1,3,5-Trimethylbenzene]						
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flamm) Change: N.R. Provide: Quick drench		TBAL	Inh Ing Con	Irrit eyes, skin, upper resp sys, dermat; in animals: terato effects	Eye: Irr irritated Skin: Soap flush Breath: Resp support Swallow: Medical attention Irritated	Eyes, skin, resp sys, resp sys
[Trimethyl phosphite]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
2,4,6-Trinitrotoluene $\text{CH}_3\text{C}_6\text{H}_2(\text{NO}_2)_3$ 118-96-7 XU0175000	1-Methyl-2,4,6- Trinitrobenzene; TNT; Trinitrotoluene; sym-Trinitrotoluene; Trinitrotoluol	NIOSH 0.5 mg/m ³ [skin] OSHA† 1.6 mg/m ³ [skin]	500 mg/m ³	Colorless to pale- yellow, odorless solid or crushed flakes.	MW 227.1 BP 464°F (Explodes) Sol(77°F) 0.01% FLP ? (Explodes) IP 10.59 eV Sp Gr 1.65 Combustible Solid (Class A Explosive)	VP: 0.0002 mm MLT 176°F UEL ? LEL ?	Strong oxidizers, ammonia, strong alkalis, combustible materials, heat [Note: Rapid heating will result in detonation.]	Tenax GC, Acetone, GC/TEA, OSHA [#44]
1356 33 (wet)								
Triorthocresyl phosphate $(\text{CH}_3)_2\text{C}_6\text{H}_4\text{PO}_3$ 78-30-8 TD0350000	TCP, TOCP, Tri-o-cresyl ester of phosphoric acid, Tri-o-cresyl phosphate	NIOSH 0.1 mg/m ³ [skin] OSHA† 0.1 mg/m ³	40 mg/m ³	Colorless to pale- yellow, odorless liquid or solid (below 52°F)	MW 366.4 BP 770°F (Decomposes) Sol: Slight FLP 437°F IP ? Sp Gr 1.20 Class IIIB Combustible Liquid	VP(77°F): 0.00022 mm FRZ 52°F UEL ? LEL ?	Oxidizers	Filter, Diethyl ether, GC/FPD, II [#S209]
2574 55	1 ppm = 15.31 mg/m ³							
Triphenylamine $(\text{C}_6\text{H}_5)_3\text{N}$ 603-34-9 YK2680000	N,N-Diphenylaniline; N,N-Diphenylbenzenamine	NIOSH 5 mg/m ³ OSHA† none	N.D.	Colorless solid.	MW: 245.3 BP: 689°F Sol: Insoluble FLP: ? IP: 7.60 eV Sp.Gr: 0.77	VP: ? MLT: 261°F UEL: ? LEL: ?	None reported	None available
Triphenyl phosphate $(\text{C}_6\text{H}_5)_3\text{PO}$ 115-86-6 TC8400000	Phenyl phosphate, TPP, Triphenyl ester of phosphoric acid	NIOSH/OSHA 3 mg/m ³	1000 mg/m ³	Colorless, crystalline powder with a phenol-like odor.	MW 326.3 BP 776°F Sol(129°F): 0.0002% FLP 428°F IP ? Sp Gr 29 C: ... Solid	VP(380°F): 1 mm MLT 120°F UEL ? LEL ?	None reported	Filter, Diethyl ether, GC/FPD, II [#S210]

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 8)
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When contam/Daily When wet or contam Daily	NIOSH 5 mg/m ³ SA* 12.5 mg/m ³ SA, CF* 25 mg/m ³ SCBAF/SAF 500 mg/m ³ SAF, PD, PP § SCBAF, PD, PP/SAF, PD, PP, ASCBA Escape: GMFOVH/SCBAE	Inh Abs Ing Con	Irrit skin, muc memb; liver damage, jaun, cyan, sneez; cough, sore throat, per neur, musc pain, kidney damage, cataract, sens derm, leucyt, anemia, card irreg	Eye: Skin: Breath: Swallow: Irr immed Soap wash prompt Resp support Medical attention immed	Eyes, skin, resp,ays, blood, liver, CVS, CNS, kidneys
[2,4,6-Trinitrotoluene]						
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact N.R. When contam When wet or contam N.R.	NIOSH/OSHA 0.5 mg/m ³ DM 1 mg/m ³ DMXSQ/SA 2.5 mg/m ³ SA, CF/PAPRDM 5 mg/m ³ H/E/SAT, CF/PAPRTHIE/ SCBAF/SAF 40 mg/m ³ SA, PD, PP § SCBAF, PD, PP/SAF, PD, PP, ASCBA Escape: H/E/SCBAE	Inh Abs Ing Con	GI dist, per neur; cramps in calves, pares in feet or hands, weak feet, wrist drop, pare	Eye: Skin: Breath: Swallow: Irr immed Soap wash immed Resp support Medical attention immed	PNS, CNS
[Trithoroseyl phosphate]						
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact Daily N.R. Daily	TBAL	Inh Ing Con	In animals: irrit skin	Eye: Skin: Breath: Swallow: Irr immed Soap wash Resp support Medical attention immed	Skin
[Triphenylamine]						
Skin: Eyes: Wash skin: Remove: Change:	N.R. N.R. N.R. N.R. N.R.	NIOSH/OSHA 15 mg/m ³ D 30 mg/m ³ H/E/DXSQ/SA 75 mg/m ³ SA, CF/PAPRDM 150 mg/m ³ H/E/SAT, CF/PAPRTHIE/ SCBAF/SAF 1000 mg/m ³ SA, PD, PP § SCBAF, PD, PP/SAF, PD, PP, ASCBA Escape: H/E/SCBAE	Inh Ing	Minor changes in blood enzymes, in animals: musc weak, pare	Breath: Swallow: Resp support Medical attention immed	Blood, PNS
[Triphenyl phosphate]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, Flammability	VP, FRZ UEL, LEL		
Tungsten W 7440-33-7 Y07176000	Tungsten metal, Wolfram	NIOSH 5 mg/m ³ ST 10 mg/m ³ [Note: The REL also applies to other insoluble tungsten compounds (as W).] OSHA† none	N.D.	Hard, brittle, steel-gray to tin-white solid.	MW: 183.8 BP: 10,701°F Sol: Insoluble FLP: NA IP: NA Sp. Gr: 19.3 Combustible in the form of finely divided powder; may ignite spontaneously.	VP: 0 mm (approx) MLT: 6170°F UEL: NA LEL: NA	Bromine trifluoride, chlorine trifluoride, fluorine, iodine pentafluoride	Filter; Acid; AA; B [#7074]
Tungsten (soluble compounds, as W)	Synonyms vary depending upon the specific soluble tungsten compound.	NIOSH 1 mg/m ³ ST 3 mg/m ³ OSHA† none	N.D.	Appearance and odor vary depending upon the specific soluble tungsten compound.	Properties vary depending upon the specific soluble tungsten compound.	Varies		Filter; Acid; AA; B [#7074]
Tungsten carbide (cemented) WC/Co/Ni/Ti 1: 11107-01-0 2: 12718-49-3 3: 37329-49-0 1: Y07350000 2: Y07525000 3: Y07700000	Cemented tungsten carbide, Cemented WC, Hard metal [Note: The tungsten carbide (WC) content is generally 85-95% & the cobalt content is generally 5-15%.] [1: 85% WC, 15% Co 2: 82% WC, 8% Co 3: 78% WC, 14% Co, 8% Ti]	NIOSH See Appendix C OSHA† See Appendix C	N.D.	A mixture of tungsten carbide, cobalt, and sometimes other metals & metal oxides or carbides.	Properties vary depending upon the specific mixture.	Tungsten carbide: Fluorine, chlorine trifluoride, oxides of nitrogen, lead dioxide	Filter; Acid; AA; B [#7027, Cobalt]	
Turpentine C ₁₀ H ₁₆ (approx) 8006-54-2 Y08400000	Gum spirits, Gum turpentine, Spirits of turpentine, Steam distilled turpentine, Sulfate wood turpentine, Turps, Wood turpentine	NIOSH/OSHA 100 ppm (560 mg/m ³)	800 ppm	Colorless liquid with a characteristic odor	MW 136 (approx) BP 309-338°F Sol: Insoluble FLP 95°F IP ? Sp Gr: 0.86 Class IC Flammable Liquid	VP 4 mm FRZ -58 to -76°F UEL ? LEL 0.8%	Strong oxidizers, chlorine, chromic anhydride, stearic chloride, chromyl chloride	Char, CS, GCFID, III [#1551]
1599-27	1 ppm = 1.0 mg/m ³ (approx)							

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 8)
Skin:	N.R.	NIOSH	Inh	Irrit eyes, skin, resp sys;	Eye:	Eyes, skin, resp sys,
Eyes:	N.R.	50 mg/m ³ : HIE/SA/SCBAF	ing	diffuse pulm fib; loss of	Skin:	blood
Wash skin:	N.R.	§: SCBAF-PD, PP/SAF-PD, PP/ASCBA	Con	appetite, nau, cough;	Breath:	
Remove:	N.R.	Escape: HIEF/SCBAE		blood changes	Swallow:	
Change:	N.R.				Irritated Soap wash Fresh air Medical attention Irritated	
[Tungsten]						
Recommendations vary depending upon the specific compound.		NIOSH	Inh	Irrit eyes, skin, resp sys;	Eye:	Eyes, skin, resp sys,
		10 mg/m ³ : HIE/SA	ing	In animals: CNS disturbances;	Skin:	CNS, GI tract
		25 mg/m ³ : SA:CF	Con	diarr; resp failure;	Breath:	
		60 mg/m ³ : HIEF/SCBAF/SAF		behavior, body weight,	Swallow:	
		§: SCBAF-PD, PP/SAF-PD, PP/ASCBA		blood changes	Irritated Water wash Resp support Medical attention Irritated	
		Escape: HIEF/SCBAE				
[Tungsten (soluble compounds, as W)]						
Skin:	Prevent skin contact	NIOSH	Inh	Irrit eyes, skin, resp sys;	Eye:	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	0.25 mg Co/m ³ : DM ^a	ing	possible skin sens to	Skin:	blood
Wash skin:	When contam/Daily (NI)	0.5 mg Co/m ³ : DM/SCF ^a /DMFu ^a /SA ^a	Con	cobalt, nickel; diffuse	Breath:	
Remove:	When wet or contam	1.25 mg Co/m ³ : SA:CF/PAPRDM ^a /		pulm fib; loss of appetite,	Swallow:	
Change:	Daily	PAPRDMFu ^a		nau, cough, blood changes	Irritated Soap wash Fresh air Medical attention Irritated	
		2.5 mg Co/m ³ : HIEF/SCBAF/SAF				
		20 mg Co/m ³ : SAF PD PP				
		§: SCBAF PD PP/SAF PD PP ASCBA				
		Escape: HIEF/SCBAE				
				Tungsten carbide (cemented) containing NICKEL		
				NIOSH		
				§: SCBAF PD PP/SAF PD PP ASCBA		
				Escape: HIEF/SCBAE		
[Tungsten carbide (cemented)]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irrit eyes, skin, nose,	Eye:	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	800 ppm: SA:CF/PAPROV/CCRFOV/	Abs	throat, head, vert,	Skin:	CNS, kidneys
Wash skin:	When contam	GMFOV/SCBAF/SAF	ing	convuls; skin sens, hema,	Breath:	
Remove:	When wet (flam)	§: SCBAF PD PP/SAF PD PP ASCBA	Con	album, kidney damage;	Swallow:	
Change:	N.R.	Escape: GMFOV/SCBAE		abdom pain, nau, vomit,	Irritated Soap wash prompt Resp support Medical attention Irritated	
				diarr, chemical pneum (aspir iq)		
[Turpentine]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TYVA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
1-Undecanethiol <chem>CH3(CH2)9SH</chem> 5332-52-5	Undecylmercaptan	NIOSH C 0.5 ppm (3.9 mg/m ³) [15-min] OSHA none	N.D.	Liquid.	MW: 188.4 BP: 495°F Sol: Insoluble FLP: 7 IP: 7	VP: 7 FRZ: 27°F UEL: 7 LEL: 7	Oxidizers, reducing agents, strong acids & bases, alkali metals	None available.
	1 ppm = 7.83 mg/m ³				Sp.Gr: 0.84 Combustible Liquid			
Uranium (insoluble compounds, as U) U (Metal) 7440-61-1 (Metal) YR3490000 (Metal) 2979-65 (Metal, pyrophoric)	Uranium metal; Uranium I Synonyms of other insoluble uranium compounds vary depending upon the specific compound.	NIOSH Ca See Appendix A 0.2 mg/m ³ ST 0.6 mg/m ³ OSHA† 0.25 mg/m ³	Ca [10 mg/m ³ (as U)]	Metal: Silver-white, malleable, ductile, lustrous solid. [Note: Weakly radioactive.]	MW: 238.0 BP: 6895°F Sol: Insoluble FLP: NA IP: NA	VP: 0 mm (approx) MLT: 2097°F UEL: NA LEL: NA MEC: 60 g/m ³	Carbon dioxide, carbon tetrachloride, nitric acid, fluorine [Note: Complete coverage of uranium metal scrap with oil is essential for prevention of fire.]	None available
					Sp.Gr: 19.05 (Metal) Metal: Combustible Solid, especially turnings and powder.			
Uranium (soluble compounds, as U)	Synonyms vary depending upon the specific soluble uranium compound.	NIOSH Ca See Appendix A 0.05 mg/m ³ OSHA 0.05 mg/m ³	Ca [10 mg/m ³ (as U)]	Appearance and odor vary depending upon the specific soluble uranium compound.	Properties vary depending upon the specific soluble uranium compound.		Uranium nitrate; combustibles Uranium hexafluoride water	None available
n-Valeraldehyde <chem>CH3(CH2)4CHO</chem> 110-62-3 YY3860000	Amyl aldehyde, Pentanal, Valeral, Valeraldehyde, Valeric aldehyde	NIOSH 60 ppm (175 mg/m ³) See Appendix C (Aldehydes) OSHA† none	N.D.	Colorless liquid with a strong, acid, pungent odor.	MW: 86.2 BP: 217°F Sol: Slight FLP: 54°F IP: 3.82 eV	VP: 26 mm FRZ: -133°F UEL: 7 LEL: 7	None reported	XAD-2; Toluene; GC/FID; IR [#2536]
					Sp.Gr: 0.81			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 6)	
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact Prevent eye contact When wet (flamr) When wet (flamr) N.R.	NIOSH 5 ppm: CCROVISA 12.5 ppm: SA-CF/PAPROV 25 ppm: CORFOV/GMFOV/PAPRTOV/ SCBAF/SAF 5 SCBAF-PD/PP/SAF-PD/PP-ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, skin, resp sys; conf, dizz, head, drow, nau, vomit, weak, convuls	Eye: Skin: Breath: Swallow:	Inn Inn Resp support Medical attention Inn	Eyes, skin, resp sys, CNS
[1-Undecanethiol]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam/Daily When wet or contam Daily Eyewash	NIOSH 5 SCBAF-PD/PP/SAF-PD/PP-ASCBA Escape: HEF/SCBAE	Inh Ing Con	Derm: kidney damage; blood changes; metastasis lung, lymph node damage Potential for cancer is a result of alpha- emitting properties & radioactive decay products (e.g., radon).	Eye: Skin: Breath: Swallow:	Inn Inn Resp support Medical attention Inn	Skin, kidneys, bone marrow, lymphatic sys [lung cancer]
[Uranium (insoluble compounds, as U)]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam/Daily When wet or contam Daily Eyewash (UF ₆), Quick drench	NIOSH 5 SCBAF-PD/PP/SAF-PD/PP-ASCBA Escape/Hazards: GMFADHE/SCBAE Escape/Non-Hazards: HEF/SCBAE	Inh Ing Con	Lac. cong. short breath, cough, chest rales, nau, vomit, skin burns, RBC, casts in urine, album, high BUN, [cort] Potential for cancer is a result of alpha- emitting properties & radioactive decay products (e.g., radon).	Eye: Skin: Breath: Swallow:	Inn Inn Resp support Medical attention Inn	Resp: sys, blood, liver, kidneys, lymphatic sys, skin, bone marrow [lung cancer]
[Uranium (soluble compounds as U)]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam N.R. Eyewash, Quick drench	TBAE	Inh Ing Con	Irrit eyes, skin, nose, throat	Eye: Skin: Breath: Swallow:	Inn Inn Resp support Medical attention Inn	Eyes, skin, resp sys
[n-Valeraldehyde]							

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and GHS Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL F.P., IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Vanadium dust V_2O_5 1314-62-1 YW2450000	Divanadium pentoxide, Vanadic anhydride, Vanadium oxide, Vanadium pentaoxide Other synonyms vary depending upon the specific vanadium compound.	NIOSH* C 0.05 mg V/m ³ [15-min] [Note: The REL applies to all vanadium compounds except Vanadium metal & Vanadium carbide (see Ferrovandium dust).] OSHA† C 0.5 mg V_2O_5 /m ³ (resp)	35 mg/m ³ (as V)	Yellow-orange powder or dark gray, odorless flakes dispersed in air.	MW 181.9 BP 3182°F (Decomposes) Sol 0.8% F.P. NA IP NA	VP 0 mm (approx) MLT 1274°F UEL NA LEL NA	Lithium, chlorine trifluoride	Filter, THF, XRD, III [#7504]
2862 53					Sp Gr 3.36 Noncombustible Solid, but may increase intensity of fire when in contact with combustible materials			
Vanadium fume V_2O_5 1314-62-1 YW2460000	Divanadium pentoxide, Vanadic anhydride, Vanadium oxide, Vanadium pentaoxide Other synonyms vary depending upon the specific vanadium compound.	NIOSH* C 0.05 mg V/m ³ [15-min] OSHA† C 0.1 mg V_2O_5 /m ³	35 mg/m ³ (as V)	Finely divided particulate dispersed in air	MW 181.9 BP 3182°F (Decomposes) Sol 0.8% F.P. NA IP NA	VP 0 mm (approx) MLT 1274°F UEL NA LEL NA	Lithium, chlorine trifluoride	Filter, THF, XRD, III [#7504]
2862 53					Sp Gr 3.36 Noncombustible Solid			
Vegetable oil mist 88956-88-3 YX1850000	Vegetable mist	NIOSH 10 mg/m ³ (total) 5 mg/m ³ (resp) OSHA 15 mg/m ³ (total) 5 mg/m ³ (resp)	N.D.	An oil extracted from the seeds, fruit, or nuts of vegetables or other plant matter.	MW: varies BP: ? Sol: insoluble F.P.: 323-540°F IP: ?	VP: ? FRZ: ? UEL: ? LEL: ?	None reported	Filter; none; Grav; III [Nuisance Dust: #0500 (total), #0800 (resp)]
Vinyl acetate $CH_3-CH=OOCCH_3$ 108-05-4 AK0878000	1-Acetoxystyrene, Ethenyl acetate, Ethenyl ethanoate, VAC, Vinyl acetate monomer, Vinyl ethanoate	NIOSH C 4 ppm (15 mg/m ³) [15-min] OSHA† none	N.D.	Colorless liquid with a pleasant, fruity odor. [Note: Raw material for many poly- vinyls.]	MW: 86.1 BP: 162°F Sol: 2% F.P.: 18°F IP: 9.19 eV	VP: 83 mm FRZ: -136°F UEL: 13.4% LEL: 2.6%	Acids, bases, silica gel, alumina, oxidizers, azo compounds, ozone [Note: Usually con- tains a stabilizer (e.g., hydroquinone or phenar) to prevent polymerization.]	Chrom; none; GC/FID; III [P&CAM #276]

Sp. Gr. 0.93

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection → maximum concentration for use (MUC) (See Table 4)	Health hazards					
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)		
Skin:	Prevent skin contact	NIOSH (as V) 0.5 mg/m ³ HE/TA* 1.25 mg/m ³ SA CF/PAPRHE* 2.5 mg/m ³ HEF/PAPRTH ² /V SCBAF/SAF 35 mg/m ³ : SAF-PD,PP § SCBAF-PD,PP/SAF-PD,PP ASCBA Escape: HEF/SCBAE	Inh	Irrit eyes, skin, throat,	Eye:	Irr. immed.	Eyes, skin, resp sys	
Eyes:	Prevent eye contact		Ing	green tongue, metallic	Skin:	Soap wash prompt		Resp support Medical attention immed
Wash skin:	When contam		Con	taste, eczema, cough, fine	Breath:			
Remove:	When wet or contam			rales, wheez, bronch. dysp	Swallow			
Change:	N.R.							
[Vanadium dust]								
Skin:	N.R.	NIOSH (as V) 0.5 mg/m ³ HE/TA* 1.25 mg/m ³ SA CF/PAPRHE* 2.5 mg/m ³ HEF/PAPRTH ² /V SCBAF/SAF 35 mg/m ³ : SAF-PD,PP § SCBAF-PD,PP/SAF-PD,PP ASCBA Escape: HEF/SCBAE	Inh	Irrit eyes, throat, green	Breath:	Resp support	Eyes, skin, resp sys	
Eyes:	N.R.		Con	tongue, metallic taste,				
Wash skin:	N.R.			cough, fine rales, wheez,				
Remove:	N.R.			bronch. dysp, eczema				
Change:	N.R.							
[Vanadium fume]								
Skin:	N.R.	TBAL	Inh	Irrit eyes, skin, resp sys; lac	Eye:	Irr. immed.	Eyes, skin, resp sys	
Eyes:	N.R.		Con		Breath:	Fresh air		
Wash skin:	N.R.							
Remove:	N.R.							
Change:	N.R.							
[Vegetable oil mist]								
Skin:	Prevent skin contact	NIOSH 40 ppm: CCROV/TA* 100 ppm: SA, CF/PAPROV* 200 ppm: CCRFOV/GMFOV/PAPRTOV/ SCBAF/SAF 4000 ppm: SA, PD, PP* § SCBAF-PD,PP/SAF-PD,PP ASCBA Escape: GMFOV/SCBAE	Inh	Irrit eyes, skin, nose,	Eye:	Irr. immed.	Eyes, skin, resp sys	
Eyes:	Prevent eye contact		Ing	throat; hoarseness, cough;	Skin:	Soap flush immed		
Wash skin:	When contam		Con	loss of smell, eye burns,	Breath:	Resp support		
Remove:	When wet or contam			skin blisters	Swallow	Medical attention immed		
Change:	N.R.							
Provide:	Eyewash, Quick drench							
[Vinyl acetate]								

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Vinyl bromide $\text{CH}_2=\text{CHBr}$ 593-80-2 K08400000	Bromoethene, Bromoethylene	NIOSH Ca See Appendix A OSHA† none	Ca [N.D.]	Colorless gas or liquid (below 60°F) with a pleasant odor. [Note: Shipped as a liquefied compressed gas with 0.1% phenol added to prevent polymerization.]	MW: 107.0 BP: 60°F Sol: Insoluble Fl.P: NA (Gas) IP: 9.80 eV RGasD: 3.79 Sp Gr: 1.49 (Liquid at 60°F) Flammable Gas Class IA Flammable Liquid	VP: 1.4 atm FRZ: -219°F UEL: 19% LEL: 9%	Strong oxidizers [Note: May polymerize in sunlight.]	Char; Ethanol; GC/FID; II [#1009]
1065 80	1 ppm = 4.45 mg/m ³							
Vinyl chloride $\text{CH}_2=\text{CHCl}$ 75-01-4 K09625000	Chloroethene, Chloroethylene, Ethylene monochloride, Monochloroethane, Monochloroethylene, VC, Vinyl chloride monomer (VCM)	NIOSH Ca See Appendix A [Use 1910.1017] 1 ppm C 5 ppm [15-min] OSHA† none	Ca [N.D.]	Colorless gas or liquid (below 7°F) with a pleasant odor at high concen- trations. [Note: Shipped as a liquefied compressed gas.]	MW: 62.5 BP: 7°F Sol: (77°F) 0.1% Fl.P: NA (Gas) IP: 9.99 eV RGasD: 2.21 Flammable Gas	VP: 3.3 atm FRZ: -256°F UEL: 33.0% LEL: 3.6% VC: 77°F LEL: 3.6%	Copper, oxidizers, aluminum, peroxides, iron, steel [Note: Polymerizes in air, sunlight, or heat unless stabilized by inhibi- tors such as phenol. Attacks iron & steel in presence of moisture.]	Char(2). CS, GC/FID, III [#1007]
1066 17	1 ppm = 2.60 mg/m ³							
Vinyl cyclohexene dioxide $\text{C}_8\text{H}_{10}\text{O}_2$ 106-87-8 RN8640000	1-Epoxyethyl-3,4-epoxy- cyclohexene; 4-Vinylcyclohexene dioxide; 4-Vinyl-1-cyclohexene dioxide	NIOSH Ca Appendix A 10 ppm (60 mg/m ³) [skin] OSHA† none	Ca [N.D.]	Colorless liquid.	MW: 140.2 BP: 441°F Sol: High Fl.P (oc): 230°F IP: 7 Sp Gr: 1.10 Class IIIB Combustible Liquid	VP: 0.1 mm FRZ: -164°F UEL: 7 LEL: 7	Alcohols, amines, water [Note: Slowly hydrolyzes in water.]	None available
1067 17	1 ppm = 5.83 mg/m ³							
Vinyl fluoride $\text{CH}_2=\text{CHF}$ 75-02-5 Y27361000	Fluoroethene, Fluoroethylene, Monofluoroethylene, Vinyl fluoride monomer	NIOSH C 5 ppm [use 1910.1017] OSHA none	N.D.	Colorless gas with a faint, ethereal odor. [Note: Shipped as a liquefied compressed gas.]	MW: 46.1 BP: -80°F Sol: Insoluble Fl.P: NA (Gas) IP: 10.37 eV	VP: 25.2 atm FRZ: -257°F UEL: 21.7% LEL: 2.8%	None reported [Note: Inhibited with 0.2% terpenes to prevent polymeriza- tion.]	None available

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 6)	
Skin: Eyes: Wash skin: Remove: Change:	Prevent skin contact (liq) Prevent eye contact (liq) When contam (liq) When wet (flamm) N.R.	NIOSH 5: SCBAF:PD,PP/SAF:PD,PP/ASCBA Escape: GMFOV/SCBAE	Inh liq (liq) Con (liq)	Irrit eyes, skin; dizz, conf, inco, narco, nau, vomit; liq: frostbite; [canc]	Eye: Skin: Breath: Swallow:	Irr Immed (liq) Water/rush Immed (liq) Resp support Medical attention Immed (liq)	Eyes, skin, CNS, liver [in animals: liver & lymph node tumors]
[Vinyl bromide]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Frostbite Frostbite N.R. When wet (flamm) N.R. Frostbite	NIOSH 5: SCBAF:PD,PP/SAF:PD,PP/ASCBA Escape: GMFS/SCBAE	Inh Con (liq)	Weak, abdom pain, GI bleeding, enlarged liver; pallor or cyan of extremities; liq: frostbite; [canc]	Eye: Skin: Breath:	Frostbite Frostbite Resp support	Liver, CNS, blood, resp sys, lymphatic sys [liver cancer]
[Vinyl chloride]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Prevent skin contact Prevent eye contact When contam When wet or contam N.R. Eyewash, Quick drench	NIOSH 5: SCBAF:PD,PP/SAF:PD,PP/ASCBA Escape: GMFOV/SCBAE	Inh Abs ing Con	In animals: Irrit eyes, skin, resp sys; testicular atrophy; leupen; nec thymus; skin area; [canc]	Eye: Skin: Breath: Swallow:	Irr Immed Water/wash Immed Resp support Medical attention Immed	Eyes, skin, resp sys, blood, thymus, repro sys [in animals: skin tumors]
[Vinyl cyclohexene dioxide]							
Skin: Eyes: Wash skin: Remove: Change: Provide:	Frostbite Frostbite N.R. When wet (flamm) N.R. Frostbite	NIOSH 10 ppm: CCROV/BA 25 ppm: SA:CF/PAPROV 50 ppm: CCRFOV/GMFOV/PAPRTQV/ SCBAF/SAF 200 ppm: SAF:PD,PP 5: SCBAF:PD,PP/SAF:PD,PP/ASCBA Escape: GMFOV/SCBAE	Inh Con (liq)	Head, dizz, conf, inco, narco, nau, vomit; liq: frostbite	Eye: Skin: Breath:	Frostbite Frostbite Resp support	CNS
[Vinyl fluoride]							

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWAs unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					NW, BP, SOL, FLP, IP, Sp, Gr, Flammability	VP, FRZ UEL, LEL		
Vinylidene chloride $\text{CH}_2=\text{CCl}_2$ 75-35-4 KV9275000	1,1-DCE; 1,1-Dichloroethene; 1,1-Dichloroethylene; VDC; Vinylidene chloride monomer; Vinylidene dichloride	NIOSH Ca See Appendix A OSHA† none	Ca [N.D.]	Colorless liquid or gas (above 89°F) with a mild, sweet, chloroform-like odor.	NW: 98.9 BP: 89°F Sol: 0.04% FLP: -2°F IP: 10.00 eV	VP: 600 mm FRZ: -189°F UEL: 16.5% LEL: 6.5%	Aluminum, sunlight, air, copper, heat [Note: Polymerization may occur if exposed to oxidizers, chlorosulfonic acid, nitric acid, or oleum. Inhibitors such as the monomethyl ether of hydroquinone are added to prevent polymerization.]	Char; CS; GCFID; III [#1016]
1303 26	1 ppm = 4.63 mg/m³				Sp, Gr: 1.21 Class IA Flammable Liquid			
Vinylidene fluoride $\text{CH}_2=\text{CF}_2$ 75-35-7 KW0560000	Difluoro-1,1-ethylene; 1,1-Difluoroethene; 1,1-Difluoroethylene; Halocarbon 1132A; VDF; Vinylidene difluoride	NIOSH 1 ppm C 6 ppm [see 1910.1017] OSHA none	N.D.	Colorless gas with a faint, ethereal odor. [Note: Shipped as a liquefied compressed gas.]	NW: 64.0 BP: -122°F Sol: Insoluble FLP: NA (Gas) IP: 10.29 eV	VP: 35.2 atm FRZ: -227°F UEL: 21.3% LEL: 5.6%	Oxidizers, aluminum chloride [Note: Violent reaction with hydrogen chloride when heated under pressure.]	None available
1969 22	1 ppm = 2.66 mg/m³				RGasD: 2.21 Flammable Gas			
Vinyl toluene $\text{CH}_2=\text{CHC}_6\text{H}_4\text{CH}_3$ 25013-15-4 WL5075000	Ethynylmethylbenzene, Methylstyrene, Tolylethylene	NIOSH/OSHA 100 ppm (480 mg/m³)	400 ppm	Colorless liquid with a strong, disagreeable odor.	MW: 118.2 BP: 339°F Sol: 0.009% FLP: 127°F IP: 8.20 eV	VP: 1 mm FRZ: -106°F UEL: 11.0% LEL: 0.8%	Oxidizers, peroxides, strong acids, iron or aluminum salts [Note: Usually inhibited with tert-butyl catechol to prevent polymerization.]	Char; CS; GCFID; III [#1501, Aromatic Hydrocarbons]
2618 27	1 ppm = 4.91 mg/m³				Sp, Gr: 0.89 Class II Combustible Liquid			
VM & P Naphtha 8032-32-4 O16190000	Ligroin, Painters naphtha, Petroleum ether, Petroleum spirit, Refined solvent naphtha, Varnish makers' naphtha	NIOSH 350 mg/m³ C 1800 mg/m³ [15-min] OSHA† none	N.D.	Clear to yellowish liquid with a pleasant, aromatic odor.	MW: 87-114 (approx) BP: 203-320°F Sol: Insoluble FLP: 20-65°F IP: 7	VP: 2-20 mm FRZ: ? UEL: 6.0% LEL: 1.2%	None reported [Note: VM&P Naphtha is a refined petroleum solvent predominantly C ₆ -C ₁₀ , which is typically 55% paraffins, 30% mono- cyclic aromatics, 2% dicyclo- pentadienes, and 13% alkylbenzenes.]	Char; CS; GCFID; III [#1560, Naphthalene]
4994 28	1 ppm = 5.54 mg/m³				Sp, Gr(50°F): 0.73-0.76 Class II Combustible Liquid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 8)
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flamm) Change: N.R. Provide: Eyewash, Quick drench		NIOSH § SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, skin, throat; dizz, head, nau; dysap; liver, kidney dysfunc; pneumis; [canc]	Eye: Skin: Breath: Swallow: Irr Irrmed Water flush Irrmed Resp support Medical attention Irrmed	Eyes, skin, resp sys, CNS, liver, kidneys [in animals: liver & kidney tumors]
[Vinylidene chloride]						
Skin: Frostbite Eyes: Frostbite Wash skin: N.R. Remove: When wet (flamm) Change: N.R. Provide: Frostbite		NIOSH 10 ppm: CCROV/SA 25 ppm: SA, CF/PAPROV 50 ppm: CCRFOV/GMFOV/PAPRTOV/ SCBAF/SAF 200 ppm: SAF:PD,PP § SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Con (liq)	Dizz, head, nau; liq; frostbite	Eye: Skin: Breath: Frostbite Frostbite Resp support	CNS
[Vinylidene fluoride]						
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R.		NIOSH/OSHA 400 ppm: CCROV*/PAPROV*/GMFOV/ SA*/SCBAF § SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, skin, upper resp sys; drow In animals: narco	Eye Skin Breath Swallow Irr Irrmed Soap flush prompt Resp support Medical attention Irrmed	Eyes, skin, resp sys, CNS
[Vinyl toluene]						
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flamm) Change: N.R.		NIOSH 3500 mg/m ³ : CCROV/SA 8750 mg/m ³ : SA, CF/PAPROV 17,500 mg/m ³ : CCRFOV/GMFOV/ PAPRTOV/SCBAF/SAF § SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, upper resp sys; derm, CNS depre; chemical pneu (aspir liq)	Eye: Skin: Breath: Swallow: Irr Irrmed Soap wash prompt Resp support Medical attention Irrmed	Eyes, skin, resp sys, CNS
[Vinyl & P naphthal]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide No.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL FLP, IP, Sp, Gr, flammability	VP, FRZ UEL, LEL		
Warfarin $C_{14}H_{14}O_4$ 81-81-2 GN4550000	3-(α -Acetonyl)-benzyl- 4-hydroxycoumarin, 4-Hydroxy-3-(3-oxo-1-phenyl- butyl)-2H-1-benzopyran- 2-one, WARF	NIOSH/OSHA 0.1 mg/m ³	100 mg/m ³	Colorless, odorless, crystalline powder. [rodenticide]	MW: 308.3 BP: Decomposes Sol: 0.002% FLP: ? IP: ?	VP(71°F): 0.09 mm MLT: 322°F UEL: ? LEL: ?	Strong oxidizers	Filter; Methanol; HPLC/UV/D; IR [85002]
					Sp. Gr. 7 Combustible Solid			
Welding fumes ZC2850000	Synonyms vary depending upon the specific component of the welding fumes.	NIOSH Ca See Appendix A OSHA† none	Ca [N.D.]	Fumes generated by the process of joining or cutting pieces of metal by heat, pressure, or both.	Properties vary depending upon the specific component of the welding fumes.		Varies	Filter; none; XRF; IR [87200]
Wood dust ZC8850000	Hard wood dust, Soft wood dust, Western red cedar dust	NIOSH Ca See Appendix A 1 mg/m ³ OSHA† 15 mg/m ³ (total) 5 mg/m ³ (resp)	Ca [N.D.]	Dust from various types of wood.	MW: varies BP: NA Sol: ? FLP: NA IP: NA Sp. Gr. ? Combustible Solid	VP: 0 mm (approx) MLT: NA UEL: NA LEL: NA	None reported	Filter; none; Grav; IR [90500, Nuisance Dust (total)]
<i>o</i> -Xylene $C_8H_{10}(CH_3)_2$ 95-47-8 ZE2460000	1,2-Dimethylbenzene, ortho-Xylene, <i>o</i> -Xylol	NIOSH 100 ppm (435 mg/m ³) ST 150 ppm (655 mg/m ³) OSHA† 100 ppm (435 mg/m ³)	900 ppm	Colorless liquid with an aromatic odor.	MW 106.2 BP: 292°F Sol: 0.02% FLP: 90°F IP: 8.56 eV Sp. Gr. 0.86 Flammable liquid	VP: 7 mm FRZ: -13°F UEL: 8.7% LEL: 0.9%	Strong oxidizers, strong acids	Char; CS; GC/MS; IR [91501 Aromatic Hydro- carbons]

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	Prevent skin contact	NIOSH/OSHA 0.5 mg/m ³ DM 1 mg/m ³ DMX/SQ/SA 2.5 mg/m ³ SA CF/PAPRDM 5 mg/m ³ HIEF/SAT CF/PAPRTHIE/ SCBAF/SAF 100 mg/m ³ SA PD PP § SCBAF PD PP/SAF PD PP ASCBA Escape: HIEF/SCBAE	Inh Abs Ing Con	Hema, back pain, hematoma arms, legs, epis, bleeding lips, muc memb hemorrh, abdom pain, vomit, fecal blood, petechial rash, abnor hematologic indices	Eye: Skin: Breath: Swallow: Irr immed Soap wash prompt Resp support Medical attention immed	Blood, CVS
Eyes:	N.R.					
Wash skin:	When contam					
Remove:	When wet or contam					
Change:	Daily					
[Warfarin]						
Skin:	N.R.	NIOSH § SCBAF PD PP/SAF PD PP ASCBA Escape: GMFOVHIE/SCBAE	Inh Con	Symptoms vary depending upon the specific component of the welding fumes; metal fume fever; flu-like symptoms, dysp, cough, musc pain, fever, chills; interstitial pneu; [canc]	Eye: Skin: Breath: Irr immed Soap wash Resp support	Eyes, skin, resp sys, CNS [lung cancer]
Eyes:	N.R.					
Wash skin:	N.R.					
Remove:	N.R.					
Change:	N.R.					
[Welding fumes]						
Skin:	N.R.	NIOSH § SCBAF PD PP/SAF PD PP ASCBA Escape: HIEF/SCBAE	Inh Con	Irrit eyes; epis, derm; resp hypersensitivity; granulomatous pneumonia; asthma; cough, wheez, sinusitis, prolonged colds; [canc]	Eye: Skin: Breath: Irr immed Soap wash Fresh air	Eyes, skin, resp sys [nasal cancer]
Eyes:	N.R.					
Wash skin:	N.R.					
Remove:	N.R.					
Change:	N.R.					
[Wood dust]						
Skin:	Prevent skin contact	NIOSH/OSHA 900 ppm: CCROV/PAPROV/SA/SCBAF § SCBAF PD PP/SAF PD PP ASCBA Escape: GMFOVHIE/SCBAE	Inh Abs Ing Con	Irrit eyes, skin, nose, throat, dizz, excitement, drows, inco, staggering gait, corn vacuolization, anor, nau, vomit, abdom pain, derm	Eye: Skin: Breath: Swallow: Irr immed Soap wash prompt Resp support Medical attention immed	Eyes, skin, resp sys, CNS, GI tract, blood, liver, kidneys
Eyes:	Prevent eye contact					
Wash skin:	When contam					
Remove:	When wet (flamm)					
Change:	N.R.					
[o-Xylene]						

Chemical name, structure formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL, FL P, IP, Sp, Gr, Flammability	VP, FRZ UEL, LEL		
m-Xylene $C_8H_{10}(CH_3)_2$ 108-38-3 ZE2275000	1,3-Dimethylbenzene, meta-Xylene, m-Xylol	NIOSH 100 ppm (435 mg/m ³) ST 150 ppm (655 mg/m ³) OSHA† 100 ppm (435 mg/m ³)	900 ppm	Colorless liquid with an aromatic odor.	MW: 106.2 BP: 282°F Sol: Slight FL P: 82°F IP: 8.56 eV	VP: 9 mm FRZ: -54°F UEL: 7.0% LEL: 1.1%	Strong oxidizers, strong acids	Char, CS, GC/FID, IR [#1501, Aromatic Hydrocarbons]
1307 27	1 ppm = 4.41 mg/m ³				Sp Gr: 0.86 Class IC Flammable Liquid			
p-Xylene $C_8H_{10}(CH_3)_2$ 106-42-3 ZE2625000	1,4-Dimethylbenzene, para-Xylene, p-Xylol	NIOSH 100 ppm (435 mg/m ³) ST 150 ppm (655 mg/m ³) OSHA† 100 ppm (435 mg/m ³)	900 ppm	Colorless liquid with an aromatic odor. [Note: A solid below 56°F.]	MW: 106.2 BP: 281°F Sol: 0.02% FL P: 81°F IP: 8.44 eV	VP: 9 mm FRZ: 56°F UEL: 7.0% LEL: 1.1%	Strong oxidizers, strong acids	Char, CS, GC/FID, IR [#1501, Aromatic Hydrocarbons]
1307 27	1 ppm = 4.41 mg/m ³				Sp Gr: 0.86 Class IC Flammable Liquid			
m-Xylene, α,α'-diamine $C_8H_8(CH_2NH_2)_2$ 1477-85-0 PF8970000	1,3-bis(Aminomethyl)benzene; 1,3-Benzenedimethanamine; MXDA; m-Phenylenediamine(methylaniline); m-Xylylenediamine	NIOSH C 0.1 mg/m ³ [skin] OSHA† none	N.D.	Colorless liquid.	MW: 136.2 BP: 477°F Sol: Miscible FL P: 243°F IP: ?	VP(77°F): 0.03 mm FRZ: 58°F UEL: ? LEL: ?	None reported	None available
	1 ppm = 8.66 mg/m ³				Sp Gr: 1.032 Class IB Combustible Liquid			
Xylidine $(CH_3)_2C_6H_4NH_2$ 1300-73-8 ZE8575000	Aminodimethylbenzene, Aminoxylene, Dimethylaminobenzene, Dimethylaniline, Xylidine isomers (e.g., 2,4-Dimethylaniline) [Note: Dimethylaniline is also used as a synonym for 4-Nitrodimethylaniline.]	NIOSH 2 ppm (10 mg/m ³) [skin] OSHA† 5 ppm (25 mg/m ³) [skin]	50 ppm	Pale yellow to brown liquid with a weak, aromatic, amine-like odor.	MW: 121.2 BP: 415-439°F Sol: Slight FL P: 206°F (2,3-) IP: 7.65 eV (2,4-), 7.30 eV (2,6-)	VP: <1 mm FRZ: -33°F UEL: ? LEL: 1.0% (2,3-)	Strong oxidizers, hypochlorite salts	Si gel, Ethanol, GC/FID, IR [#2002]

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irr: eyes, skin, nose,	Eye	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	900 ppm: CCROV*/PAPROV*/SA*/SCBAF	Abs	throat, dizz, excitement,	Skin	CNS, GI tract, blood,
Wash skin:	When contam	§ SCBAF PD PP/SAF PD PP ASCBA	Ing	drow, inco, staggering	Breath	liver, kidneys
Remove:	When wet (flam)	Escape: GMFOV/SCBAE	Con	gait, com vacuolization, anor, nau, vomit, abdom pain, derm	Swallow	
Change:	N.R.					
[m-Xylene]						
Skin:	Prevent skin contact	NIOSH/OSHA	Inh	Irr: eyes, skin, nose,	Eye	Eyes, skin, resp sys,
Eyes:	Prevent eye contact	900 ppm: CCROV*/PAPROV*/SA*/SCBAF	Abs	throat, dizz, excitement,	Skin	CNS, GI tract, blood,
Wash skin:	When contam	§ SCBAF PD PP/SAF PD PP ASCBA	Ing	drow, inco, staggering	Breath	liver, kidneys
Remove:	When wet (flam)	Escape: GMFOV/SCBAE	Con	gait, com vacuolization, anor, nau, vomit, abdom pain, derm	Swallow	
Change:	N.R.					
[p-Xylene]						
Skin:	Prevent skin contact	TBAL	Inh	In animals: Irr: eyes,	Eye	Eyes, skin, resp sys,
Eyes:	Prevent eye contact		Abs	skin, liver, kidney, lung	Skin	liver, kidneys
Wash skin:	When contam		Ing	damage	Breath:	
Remove:	When wet or contam		Con		Swallow:	
Change:	N.R.					
Provide:	Eyewash, Quick drench,					
[m-Xylene α, α' -diamine]						
Skin:	Prevent skin contact	NIOSH	Inh	Anoxia, cyan, methemo;	Eye	Resp sys, blood,
Eyes:	Prevent eye contact	20 ppm: CCROV/SA	Abs	lung, liver, kidney damage	Skin	liver, kidneys, CVS
Wash skin:	When contam	50 ppm: SA, CF/CCRFOV/GMFOV/	Ing		Breath:	
Remove:	When wet or contam	PAPROV/SCBAF/SAF	Con		Swallow:	
Change:	N.R.	§ SCBAF PD PP/SAF PD PP ASCBA				
Provide:	Eyewash, Quick drench	Escape: GMFOV/SCBAE				
[Xylidine]						

Chemical name, structure/formula, CAS and RTECS Nos., and DOTID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL, FI, P, IP, Sp, Gr, Flammability	VP, FRZ, UEL, LEL		
Yttrium Y 7440-65-5 ZG2980000	Yttrium metal	NIOSH*OSHA* 1 mg/m ³ [*Note: The REL and PEL also apply to other yttrium compounds (as Y).]	500 mg/m ³ (as Y)	Dark-gray to black, odorless solid	MW: 88.9 BP: 5301°F Sol: Soluble in hot H ₂ O FI: P: NA IP: NA Sp Gr: 4.47 Noncombustible Solid in bulk form.	VP: 0 mm (approx) MLT: 2732°F UEL: NA LEL: NA	Oxidizers	Filter; Acid; ICP; III [#7300, Elements]
Zinc chloride fume ZnCl ₂ 7646-85-7 ZH1400000	Zinc dichloride fume	NIOSH 1 mg/m ³ ST 2 mg/m ³ OSHA† 1 mg/m ³	50 mg/m ³	White particulate dispersed in air.	MW: 136.3 BP: 1350°F Sol(70°F): 436% FI: P: NA IP: NA Sp Gr: 2.91 Noncombustible Solid	VP: 0 mm (approx) MLT: 554°F UEL: NA LEL: NA	Potassium	Filter; Water; AAS; OSHA [M121]
Zinc oxide ZnO 1314-13-2 ZH4810000 1616 47	Zinc peroxide	NIOSH 5 mg/m ³ (fume/dust) ST 10 mg/m ³ (fume) C 16 mg/m ³ (dust) OSHA† 5 mg/m ³ (fume) 15 mg/m ³ (total dust) 5 mg/m ³ (resp dust)	500 mg/m ³	White, odorless solid.	MW: 81.4 BP: 7 Sol(64°F): 0.0004% FI: P: NA IP: NA Sp Gr: 5.61 Noncombustible Solid	VP: 0 mm (approx) MLT: 3587°F UEL: NA LEL: NA	Chlorinated rubber (at 419°F); water [Note: Slowly decomposed by water.]	Filter; none; XRD; III [#7502] Filter; none; Grav; III [#0600]
Zinc stearate Zinc distearate, Zinc salt of stearic acid Zn(C ₁₇ H ₃₅ O ₂) ₂ 567-05-1 ZH6200000	Dibasic zinc stearate, Zinc salt of stearic acid	NIOSH 10 mg/m ³ (total) 5 mg/m ³ (resp) OSHA† 15 mg/m ³ (total) 5 mg/m ³	N.D.	Soft, white powder with a slight, characteristic odor.	MW: 632.4 BP: 7 Sol: Insoluble FI(Poc): 530°F IP: NA Sp Gr: 1.10	VP: 0 mm (approx) MLT: 294°F UEL: 7 LEL: 7 MEC: 20 g/m ³	Oxidizers, dilute acids [Note: Hydrophobic (i.e., repels water).]	Filter; none; Grav; III [Hazardous Dust] #0550 (total) #0100

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Skin:	N.R.	NIOSH/OSHA	Inh	Irrit eyes,	Eye:	Eyes, resp sys,
Eyes:	N.R.	5 mg/m ³ DM	Inh	in animals: pulm irrit,	Skin:	liver
Wash skin:	N.R.	10 mg/m ³ DMXSO/SA	Con	eye inj, possible liver damage	Breath:	
Remove:	N.R.	25 mg/m ³ SA, CF/PAPRDM			Swallow:	
Change:	N.R.	50 mg/m ³ HEF/SAT CF/PAPRTHIE/SCBAF/SAF				
		500 mg/m ³ SA, PD, PP				
		§ SCBAF, PD, PP/SAF, PD, PP, ASCBA				
		Escape: HEF/SCBAE				
[Titanium]						
Skin:	N.R.	NIOSH/OSHA	Inh	Irrit eyes, skin, nose,	Breath:	Eyes, skin, resp sys,
Eyes:	N.R.	10 mg/m ³ DMFu/SA*	Con	throat, cong, cough,	Resp support	CVS
Wash skin:	N.R.	25 mg/m ³ SA, CF*/PAPRDMFu*		copious sputum, dysp,		
Remove:	N.R.	50 mg/m ³ HEF/PAPRTHIE†		chest pain, pulm edema,		
Change:	N.R.	§ SCBAF/SAF		broncopneu, pulm fib, cor		
		§ SCBAF, PD, PP/SAF, PD, PP, ASCBA		pulmonale, fever, cyan,		
		Escape: HEF/SCBAE		tachypnea, skin burns		
[Zinc chloride fume]						
Skin:	N.R.	NIOSH/OSHA	Inh	Metal fume fever: chills,	Breath:	Resp sys
Eyes:	N.R.	50 mg/m ³ DMFu/SA		muscle aches, nau, fever,	Resp support	
Wash skin:	N.R.	125 mg/m ³ SA, CF/PAPRDMFu		dry throat, cough, weak,		
Remove:	N.R.	250 mg/m ³ HEF/SAT CF/PAPRTHIE		lass, metallic taste,		
Change:	N.R.	§ SCBAF/SAF		head, blurred vision,		
		500 mg/m ³ SA, PD, PP		low back pain, vomit, rig,		
		§ SCBAF, PD, PP/SAF, PD, PP, ASCBA		mal, tight chest, dysp,		
		Escape: HEF/SCBAE		rales, decr pulm func		
[Zinc oxide]						
Skin:	N.R.	TBAL	Inh	Irrit eyes, skin, upper	Eye:	Eyes, skin, resp sys
Eyes:	N.R.		Inh	resp sys; cough	Skin:	
Wash skin:	N.R.		Con		Breath:	
Remove:	N.R.				Swallow:	
Change:	N.R.					

[Zinc stearate]

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL, Fl.P, IP, Sp, Gr, flammability	VP, FRZ, UEL, LEL		
Zirconium compounds (as Zr)	Zirconium metal Zirconium Synonyms of other zirconium compounds vary depending upon the specific compound.	NIOSH* 5 mg/m ³ ST 10 mg/m ³ [* Note: The REL applies to all zirconium compounds (as Zr) except Zirconium tetrachloride.] OSHA† 6 mg/m ³	60 mg/m ³ (as Zr)	Metal: Soft, malleable, ductile, solid or gray to gold, amorphous powder	MW 91.2 BP 5471°F Sol Insoluble Fl.P. NA IP NA	VP 0 mm (aprox) MLT 3375°F UEL NA LEL NA	Potassium nitrate, oxidizers (Note: Fine powder may be stored completely immersed in water.)	Filter; Acid, CP, III [#7300 Elements]
7440-67-7 (Metal) Zr (Metal)					Sp Gr 6.51 (Metal) Metal Combustible, but solid form is difficult to ignite, however, powder form may ignite SPONTANEOUSLY and can continue burning under water			
ZrH ₂ 70000 (Metal) 1356 32 (powder, wet) 1932 32 (scrap) 2008 37 (powder, dry)								

Personal protection and sanitation (See Table 3)	Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
		Route	Symptoms (See Table 6)	First aid (See Table 6)	Target organs (See Table 5)
Recommendations vary depending upon the specific compound.	NIOSH/OSHA 25 mg/m ³ DM 50 mg/m ³ : DMXSO/PAPRDM/HIEF/SA/ SCBAF § SCBAF PD PP/SAF PD,PP ASCBA Escape: HIEF/SCBAE	Inh Con	Skin, lung granulomas, in animals: irrit skin, muc memb; X-ray evidence of retention in lungs	Eye: Skin: Breath: Swallow: Irritated Soap wash Resp support Medical attention immed	Skin, resp sys
[Zirconium compounds (as Zr)]					

APPENDIX A — NIOSH POTENTIAL OCCUPATIONAL CARCINOGENS

NIOSH has identified numerous substances that should be treated as potential occupational carcinogens even though OSHA may not have identified them as such. In determining their carcinogenicity, NIOSH uses the OSHA classification outlined in 29 CFR 1990.103, which states in part:

Potential occupational carcinogen means any substance, or combination or mixture of substances, which causes an increased incidence of benign and/or malignant neoplasms, or a substantial decrease in the latency period between exposure and onset of neoplasms in humans or in one or more experimental mammalian species as the result of any oral, respiratory or dermal exposure, or any other exposure which results in the induction of tumors at a site other than the site of administration. This definition also includes any substance which is metabolized into one or more potential occupational carcinogens by mammals.

NIOSH has not identified thresholds for carcinogens that will protect 100% of the population. NIOSH usually recommends that occupational exposures to carcinogens be limited to the lowest feasible concentration. To ensure maximum protection from carcinogens through the use of respiratory protection, only the most reliable and protective respirators are recommended. These include (1) a self-contained breathing apparatus (SCBA) that has a full facepiece and is operated in a positive-pressure mode, or (2) a supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary SCBA operated in a pressure-demand or other positive-pressure mode.

APPENDIX B — THIRTEEN OSHA-REGULATED CARCINOGENS

Without establishing PELs, OSHA promulgated standards in 1974 to regulate the industrial use of 13 chemicals identified as potential occupational carcinogens (2-acetylaminofluorene, 4-aminodiphenyl, benzidine, bis-chloromethyl ether, 3,3'-dichlorobenzidine, 4-dimethylaminoazobenzene, ethyleneimine, methyl chloromethyl ether, alpha-naphthylamine, beta-naphthylamine, 4-nitrobiphenyl, N-nitrosodimethylamine, and beta-propiolactone). Exposures of workers to these 13 chemicals are to be controlled through the required use of engineering controls, work practices, and personal protective equipment, including respirators. See 29 CFR 1910.1003-1910.1016 for specific details of these requirements.

Respirator selections in the *Pocket Guide* are based on NIOSH policy, which considers the 13 chemicals to be potential occupational carcinogens.

APPENDIX C — SUPPLEMENTARY EXPOSURE LIMITS

Aldehydes (Low-Molecular-Weight)

Exposure to acetaldehyde has produced nasal tumors in rats and laryngeal tumors in hamsters, and exposure to malonaldehyde has produced thyroid gland and pancreatic islet cell tumors in rats. NIOSH therefore recommends that acetaldehyde and malonaldehyde be considered potential occupational carcinogens in conformance with the OSHA carcinogen policy. Testing has not been completed to determine the carcinogenicity of acrolein, butyraldehyde (CAS#: 123-72-8), crotonaldehyde, glutaraldehyde, glyoxal (CAS#: 107-22-2), paraformaldehyde (CAS#: 30525-89-4), propionaldehyde (CAS#: 624-67-9), propionaldehyde (CAS#: 123-38-6), and n-valeraldehyde, nine related low-molecular-weight-aldehydes. However, the limited studies to date indicate that these substances have chemical reactivity and mutagenicity similar to acetaldehyde and malonaldehyde. Therefore, NIOSH recommends that careful consideration should be given to reducing exposures to these nine related aldehydes. Further information can be found in the "NIOSH Current Intelligence Bulletin 55: Carcinogenicity of Acetaldehyde and Malonaldehyde, and Mutagenicity of Related Low-Molecular-Weight Aldehydes" [DHHS (NIOSH) Publication No. 91-112.]

Asbestos

NIOSH considers asbestos (i.e., actinolite, amosite, anthophyllite, chrysotile, crocidolite, and tremolite) to be a potential occupational carcinogen and recommends that exposures be reduced to the lowest possible concentration. For asbestos fibers >5 micrometers in length, NIOSH recommends a REL of 100,000 fibers per cubic meter of air (100,000 fibers/m³), which is equal to 0.1 fiber per cubic centimeter of air (0.1 fiber/cm³), as determined by a 400-liter air sample collected over 100 minutes and NIOSH Analytical Method #7400.

APPENDIX C — SUPPLEMENTARY EXPOSURE LIMITS (Continued)

As found in 29 CFR 1910.1001, the OSHA PEL for asbestos fibers (i.e., actinolite asbestos, amosite, anthophyllite asbestos, chrysotile, crocidolite, and tremolite asbestos) is an 8-hour TWA airborne concentration of 0.1 fiber (longer than 5 micrometers and having a length-to-diameter ratio of at least 3 to 1) per cubic centimeter of air (0.1 fiber/cm^3), as determined by the membrane filter method at approximately 400X magnification with phase contrast illumination. No worker should be exposed in excess of 1 fiber/ cm^3 (excursion limit) as averaged over a sampling period of 30 minutes.

As found in 29 CFR 1910.1101, the OSHA PEL for asbestos is an 8-hour TWA airborne concentration of 2 fibers (longer than 5 micrometers and having a length-to-diameter ratio of at least 3 to 1) per cubic centimeter of air (2 fibers/cm^3) as determined by the membrane filter method at 400-450X magnification (4-millimeter objective) with phase contrast illumination. This standard applies in lieu of the revised standards governing occupational exposure to asbestos (as defined in 1910.1001) and the non-fibrous forms of tremolite, anthophyllite, and actinolite during the period and to the extent that the revised standards have been partially stayed.

Benzidine-, o-Toluidine, and o-Dianisidine-based Dyes

In December 1980, OSHA and NIOSH jointly published the Health Hazard Alert: Benzidine-, o-Toluidine, and o-Dianisidine-based Dyes. In this Alert, OSHA and NIOSH concluded that benzidine and benzidine-based dyes were potential occupational carcinogens and recommended that worker exposure be reduced to the lowest feasible level. OSHA and NIOSH further concluded that o-toluidine and o-dianisidine (and dyes based on them) may present a cancer risk to workers and should be handled with caution and exposure minimized.

APPENDIX C — SUPPLEMENTARY EXPOSURE LIMITS (Continued)

Carbon Black

NIOSH considers "Carbon Black" to be the material consisting of more than 80% elemental carbon in the form of near-spherical colloidal particles and coalesced particle aggregates of colloidal size that is obtained by the partial combustion or thermal decomposition of hydrocarbons. The NIOSH REL (10-hour TWA) for carbon black is 3.5 mg/m³. Polycyclic aromatic hydrocarbons (PAHs), particulate polycyclic organic material (PPOM), and polynuclear aromatic hydrocarbons (PNAs) are terms frequently used to describe various petroleum-based substances that NIOSH considers to be potential occupational carcinogens. Since some of these aromatic hydrocarbons may be formed during the manufacture of carbon black (and become adsorbed on the carbon black), the NIOSH REL (10-hour TWA) for carbon black in the presence of PAHs is also 0.1 mg PAHs/m³ (measured as the cyclohexane-extractable fraction). The OSHA PEL (8-hour TWA) for carbon black is 3.5 mg/m³.

Chloroethanes

NIOSH considers ethylene dichloride; hexachloroethane; 1,1,2,2-tetrachloroethane; and 1,1,2-trichloroethane; to be potential occupational carcinogens. Additionally, NIOSH recommends that the other five chloroethane compounds: 1,1-dichloroethane; ethyl chloride; methyl chloroform; pentachloroethane; and 1,1,1,2-tetrachloroethane be treated in the workplace with caution because of their structural similarity to the four chloroethanes shown to be carcinogenic in animals.

APPENDIX C — SUPPLEMENTARY EXPOSURE LIMITS (Continued)

Chromic Acid and Chromates (as CrO_3), Chromium(II) and Chromium(III) Compounds (as Cr), and Chromium Metal (as Cr)

The NIOSH REL (10-hour TWA) is 0.001 mg $\text{Cr(VI)}/\text{m}^3$ for all hexavalent chromium [Cr(VI)] compounds. NIOSH considers all Cr(VI) compounds (including chromic acid, tert-butyl chromate, zinc chromate, and chromyl chloride) to be potential occupational carcinogens. The NIOSH REL (8-hour TWA) is 0.5 mg Cr/m^3 for chromium metal and chromium(II) and chromium(III) compounds.

The OSHA PEL is 0.1 mg CrO_3/m^3 (ceiling) for chromic acid and chromates (including tert-butyl chromate with a "skin" designation and zinc chromate); 0.5 mg Cr/m^3 (8-hour TWA) for chromium(II) and chromium(III) compounds; and 1 mg Cr/m^3 (8-hour TWA) for chromium metal and insoluble salts.

Coal Tar Pitch Volatiles

NIOSH considers coal tar products (i.e., coal tar, coal tar pitch, or creosote) to be potential occupational carcinogens; the NIOSH REL (10-hour TWA) for coal tar products is 0.1 mg/m^3 (cyclohexane-extractable fraction).

The OSHA PEL (8-hour TWA) for coal tar pitch volatiles is 0.2 mg/m^3 (benzene-soluble fraction). OSHA defines "coal tar pitch volatiles" in 29 CFR 1910.1002 as the fused polycyclic hydrocarbons that volatilize from the distillation residues of coal, petroleum (excluding asphalt), wood, and other organic matter and includes substances such as anthracene, benzo(a)pyrene (BaP), phenanthrene, acridine, chrysene, pyrene, etc.

APPENDIX C — SUPPLEMENTARY EXPOSURE LIMITS (Continued)

Coke Oven Emissions

The production of coke by the carbonization of bituminous coal leads to the release of chemically-complex emissions from coke ovens that include both gases and particulate matter of varying chemical composition. The emissions include coal tar pitch volatiles (e.g., particulate polycyclic organic matter [PPOM], polycyclic aromatic hydrocarbons [PAHs], and polynuclear aromatic hydrocarbons [PNAs]), aromatic compounds (e.g., benzene and β -naphthylamine), trace metals (e.g., arsenic, beryllium, cadmium, chromium, lead, and nickel), and gases (e.g., nitric oxides and sulfur dioxide).

Cotton Dust (raw)

NIOSH recommends reducing exposures to cotton dust to the lowest feasible concentration to reduce the prevalence and severity of byssinosis; the REL is $<0.200 \text{ mg/m}^3$ (as lint-free cotton dust).

As found in OSHA Table Z-1 (29 CFR 1910.1000), the PEL for cotton dust (raw) is 1 mg/m^3 for the cotton waste processing operations of waste recycling (sorting, blending, cleaning, and willoving) and ginning. PELs for other sectors (as found in 29 CFR 1910.1043) are 0.200 mg/m^3 for yarn manufacturing and cotton washing operations, 0.500 mg/m^3 for textile mill waste house operations or for dust from "lower grade washed cotton" used during yarn manufacturing, and 0.750 mg/m^3 for textile slashing and weaving operations. The OSHA standard in 29 CFR 1910.1043 does not apply to cotton harvesting, ginning, or the handling and processing of woven or knitted materials and washed cotton. All PELs for cotton dust are mean concentrations of lint-free, respirable cotton dust collected by the vertical elutriator or an equivalent method and averaged over an 8-hour period.

APPENDIX C — SUPPLEMENTARY EXPOSURE LIMITS (Continued)

Lead

NIOSH considers "Lead" to mean metallic lead, lead oxides, and lead salts (including organic salts such as lead soaps but excluding lead arsenate). The NIOSH REL for lead (10-hour TWA) is 0.100 mg/m³; air concentrations should be maintained so that worker blood lead remains less than 0.060 mg Pb/100 g of whole blood.

OSHA considers "Lead" to mean metallic lead, all inorganic lead compounds (lead oxides and lead salts), and a class of organic compounds called soaps; all other lead compounds are excluded from this definition. The OSHA PEL (8-hour TWA) is 0.050 mg/m³; other OSHA requirements can be found in 29 CFR 1910.1025. The OSHA PEL (8-hour TWA) for lead in "non-ferrous foundries with less than 20 employees" is 0.075 mg/m³.

Mineral Dusts

These OSHA PELs for "mineral dusts" listed below are from Table Z-3 of 29 CFR 1910.1000. The OSHA PEL (8-hour TWA) for crystalline silica (as respirable quartz) is either 250 mppcf divided by the value "%SiO₂ + 5" or 10 mg/m³ divided by the value "%SiO₂ + 2". The OSHA PEL (8-hour TWA) for crystalline silica (as total quartz) is 30 mg/m³ divided by the value "%SiO₂ + 2". The OSHA PELs (8-hour TWAs) for cristobite and tridymite are ½ the values calculated above using the count or mass formulae for quartz.

The OSHA PEL (8-hour TWA) for amorphous silica (including diatomaceous earth) is either 80 mg/m³ divided by the value "%SiO₂", or 20 mppcf.

The OSHA PELs (8-hour TWAs) for mica, soapstone, and talc (not containing asbestos) are 20 mppcf. The OSHA PEL (8-hour TWA) for Portland cement is 50 mppcf. The OSHA PEL (8-hour TWA) for

APPENDIX C — SUPPLEMENTARY EXPOSURE LIMITS (Continued)

graphite (natural) is 15 mppcf.

The OSHA PEL (8-hour TWA) for coal dust (as the respirable fraction) containing less than 5% SiO_2 is 2.4 mg/m³ divided by the value "% SiO_2 + 2". The OSHA PEL (8-hour TWA) for coal dust (as the respirable fraction) containing greater than 5% SiO_2 is 10 mg/m³ divided by the value "% SiO_2 + 2".

NIAX® Catalyst ESN

In May 1978, OSHA and NIOSH jointly published the Current Intelligence Bulletin (CIB) 26: NIAX® Catalyst ESN. In this CIB, OSHA and NIOSH recommended that occupational exposure to NIAX® Catalyst ESN, its components, dimethylaminopropionitrile and bis(2-(dimethylamino)ethyl)ether, as well as formulations containing either component, be minimized. Exposures should be limited to as few workers as possible, while minimizing workplace exposure concentrations with effective work practices and engineering controls. Exposed workers should be carefully monitored for potential disorders of the nervous and genitourinary system. Although substitution is a possible control measure, alternatives to NIAX® Catalyst ESN or its components should be carefully evaluated with regard to possible adverse health effects.

Trichloroethylene

NIOSH considers trichloroethylene (TCE) to be a potential occupational carcinogen and recommends a REL of 2 ppm (as a 60-minute ceiling) during the usage of TCE as an anesthetic agent and 25 ppm (as a 10-hour TWA) during all other exposures.

APPENDIX C — SUPPLEMENTARY EXPOSURE LIMITS (Continued)

Tungsten Carbide (Cemented)

"Cemented tungsten carbide" or "hard metal" refers to a mixture of tungsten carbide, cobalt, and sometimes metal oxides or carbides and other metals (including nickel). When the cobalt (Co) content exceeds 2%, its contribution to the potential hazard is judged to exceed that of tungsten carbide. Therefore, the NIOSH REL (10-hour TWA) for cemented tungsten carbide containing >2% Co is 0.05 mg Co/m³; the applicable OSHA PEL is 0.1 mg Co/m³ (8-hour TWA). Nickel (Ni) may sometimes be used as a binder rather than cobalt. NIOSH considers cemented tungsten carbide containing nickel to be a potential occupational carcinogen and recommends a REL 0.015 mg Ni/m³ (10-hour TWA). The OSHA PEL for Insoluble Nickel (i.e., a 1 mg Ni/m³ 8-hour TWA) applies to mixtures of tungsten carbide and nickel.

APPENDIX D --- SUBSTANCES WITH NO ESTABLISHED RELs

After reviewing available published literature, NIOSH provided comments to OSHA on August 1, 1988, regarding the "Proposed Rule on Air Contaminants" (29 CFR 1910, Docket No. H-020). In these comments, NIOSH questioned whether the PELs proposed (and listed below) for the following substances included in the *Pocket Guide* were adequate to protect workers from recognized health hazards: acetylene tetrabromide [TWA 1 ppm], chlorobenzene [TWA 75 ppm], coal dust (<5% SiO₂) [2 mg/m³ (as the respirable dust fraction)], coal dust (≥ 5% SiO₂) [0.1 mg/m³ (as the respirable quartz fraction)], ethyl bromide [TWA 200 ppm; STEL 250 ppm], ethylene glycol [Ceiling 50 ppm], ethyl ether [TWA 400 ppm; STEL 500 ppm], fenthion [TWA 0.2 mg/m³ (skin)], furfural [TWA 2 ppm (skin)], 2-isopropoxyethanol [TWA 25 ppm], isopropyl acetate [TWA 250 ppm; STEL 310 ppm], isopropylamine [TWA 5 ppm; STEL 10 ppm], manganese tetroxide (as Mn) [TWA 1 mg/m³], molybdenum (soluble compounds as Mo) [TWA 5 mg/m³], nitromethane [TWA 100 ppm], m-toluidine [TWA 2 ppm (skin)], and triethylamine [TWA 10 ppm; STEL 15 ppm].

At that time, NIOSH also conducted a limited evaluation of the literature and concluded that the documentation cited by OSHA was inadequate to support the proposed PEL (as an 8-hour TWA) of 10 mg/m³ for α-alumina, benomyl, emery, glycerine (mist), graphite (synthetic), magnesium oxide fume, molybdenum (insoluble compounds as Mo), particulates not otherwise regulated, picloram, and rouge.

APPENDIX E—RESPIRATOR RECOMMENDATIONS FOR SELECTED CHEMICALS

Mercury compounds (except (organo) alkyls)

Mercury vapor:

NIOSH

0.5 mg/m³: CCRS¹/SA

1.25 mg/m³: SA/CF/PAPRS¹(canister)

2.5 mg/m³: CCRFS¹/GMFS¹/SAT:CF/
PAPRTS(canister)/
SCBAF/SAF

10 mg/m³: SA/PD,PP

§: SCBAF:PD,PP/SAF:PD,PP-ASCBA

Escape: GMFS/SCBAE

Other non (organo) alkyl mercury compounds:

NIOSH/OSHA

1 mg/m³: CCRS¹/SA

2.5 mg/m³: SA/CF/PAPRS¹(canister)

5 mg/m³: CCRFS¹/GMFS¹/SAT:CF/
PAPRTS(canister)/
SCBAF/SAF

10 mg/m³: SA/PD,PP

§: SCBAF:PD,PP/SAF:PD,PP-ASCBA

Escape: GMFS/SCBAE

APPENDIX F—MISCELLANEOUS NOTES

Benzene: The final OSHA Benzene standard in 1910.1028 applies to all occupational exposures to benzene except some subsegments of industry where exposures are consistently under the action level (i.e., distribution and sales of fuels, sealed containers and pipelines, coke production, oil and gas drilling and production, natural gas processing, and the percentage exclusion for liquid mixtures); for the excepted subsegments, the benzene limits in Table Z-2 apply (i.e., an 8-hour TWA of 10 ppm, an acceptable ceiling of 25 ppm, and 50 ppm for a maximum duration of 10 minutes as an acceptable maximum peak above the acceptable ceiling).

APPENDIX G—VACATED 1989 OSHA PELs

Acetaldehyde:	TWA 100 ppm (180 mg/m ³) ST 150 ppm (270 mg/m ³)	Allyl propyl disulfide:	TWA 2 ppm (12 mg/m ³) ST 3 ppm (18 mg/m ³)
Acetic anhydride:	C 5 ppm (20 mg/m ³)	α-Alumina:	TWA 10 mg/m ³ (total) TWA 5 mg/m ³ (resp)
Acetone:	TWA 750 ppm (1800 mg/m ³) ST 1000 ppm (2400 mg/m ³)	Aluminum (pyro powders & welding fumes, as Al):	TWA 5 mg/m ³
Acetonitrile:	TWA 40 ppm (70 mg/m ³) ST 60 ppm (105 mg/m ³)	Aluminum (soluble salts & alkyls, as Al):	TWA 2 mg/m ³
Acetylsalicylic acid:	TWA 5 mg/m ³	Amitrole:	TWA 0.2 mg/m ³
Acrolein:	TWA 0.1 ppm (0.25 mg/m ³) ST 0.3 ppm (0.8 mg/m ³)	Ammonia:	ST 35 ppm (27 mg/m ³)
Acrylamide:	TWA 0.03 mg/m ³ [skin]	Ammonium chloride fume:	TWA 10 mg/m ³ ST 20 mg/m ³
Acrylic acid:	TWA 10 ppm (30 mg/m ³) [skin]	Ammonium sulfate:	TWA 10 mg/m ³ (total) TWA 5 mg/m ³ (resp)
Allyl alcohol:	TWA 2 ppm (5 mg/m ³) ST 4 ppm (10 mg/m ³) [skin]	Aniline (and homologs):	TWA 2 ppm (8 mg/m ³) [skin]
Allyl chloride:	TWA 1 ppm (3 mg/m ³) ST 2 ppm (6 mg/m ³)	Atrazine:	TWA 5 mg/m ³
Allyl glycidyl ether:	TWA 5 ppm (22 mg/m ³) ST 10 ppm (44 mg/m ³)	Barium sulfate:	TWA 10 mg/m ³ (total) TWA 5 mg/m ³ (resp)

APPENDIX G—VACATED 1989 OSHA PELs (Continued)

Benomyl:	TWA 10 mg/m ³ (total) TWA 5 mg/m ³ (resp)	2-Butanone:	TWA 200 ppm (590 mg/m ³) ST 300 ppm (885 mg/m ³)
Benzenethiol:	TWA 0.5 ppm (2 mg/m ³)	2-Butoxyethanol:	TWA 25 ppm (120 mg/m ³) [skin]
Bismuth telluride (doped with selenium sulfide, as Bi ₂ Te ₃):	TWA 5 mg/m ³	n-Butyl acetate:	TWA 150 ppm (710 mg/m ³) ST 200 ppm (950 mg/m ³)
Borates, tetra, sodium salts (Anhydrous):	TWA 10 mg/m ³	Butyl acrylate:	TWA 10 ppm (55 mg/m ³)
Borates, tetra, sodium salts (Decahydrate):	TWA 10 mg/m ³	n-Butyl alcohol:	C 50 ppm (150 mg/m ³) [skin]
Borates, tetra, sodium salts (Pentahydrate):	TWA 10 mg/m ³	sec-Butyl alcohol:	TWA 100 ppm (305 mg/m ³)
Boron oxide:	TWA 10 mg/m ³	tert-Butyl alcohol:	TWA 100 ppm (300 mg/m ³) ST 150 ppm (450 mg/m ³)
Boron tribromide:	C 1 ppm (10 mg/m ³)	n-Butyl glycidyl ether:	TWA 25 ppm (135 mg/m ³)
Bromacil:	TWA 1 ppm (10 mg/m ³)	n-Butyl lactate:	TWA 5 ppm (25 mg/m ³)
Bromine:	TWA 0.1 ppm (0.7 mg/m ³) ST 0.3 ppm (2 mg/m ³)	n-Butyl mercaptan:	TWA 0.5 ppm (1.5 mg/m ³)
Bromine pentafluoride:	TWA 0.1 ppm (0.7 mg/m ³)	o-sec-Butylphenol:	TWA 5 ppm (30 mg/m ³) [skin]
n-Butane:	TWA 800 ppm (1900 mg/m ³)	p-tert-Butyltoluene:	TWA 10 ppm (60 mg/m ³) ST 20 ppm (120 mg/m ³)
		Calcium cyanamide:	TWA 0.5 mg/m ³

APPENDIX G—VACATED 1989 OSHA PELs (Continued)

Caprolactam:	Dust: TWA 1 mg/m ³ ST 3 mg/m ³ Vapor: TWA 5 ppm (20 mg/m ³) ST 10 ppm (40 mg/m ³)	Cesium hydroxide:	TWA 2 mg/m ³
Captafol:	TWA 0.1 mg/m ³	Chlorinated camphene:	TWA 0.5 mg/m ³ ST 1 mg/m ³ [skin]
Captan:	TWA 5 mg/m ³	Chlorine:	TWA 0.5 ppm (1.5 mg/m ³) ST 1 ppm (3 mg/m ³)
Carbofuran:	TWA 0.1 mg/m ³	Chlorine dioxide:	TWA 0.1 ppm (0.3 mg/m ³) ST 0.3 ppm (0.9 mg/m ³)
Carbon dioxide:	TWA 10,000 ppm (18,000 mg/m ³) ST 30,000 ppm (54,000 mg/m ³)	Chloroacetyl chloride:	TWA 0.05 ppm (0.2 mg/m ³)
Carbon disulfide:	TWA 4 ppm (12 mg/m ³) ST 12 ppm (36 mg/m ³) [skin]	o-Chlorobenzylidene malononitrile:	C 0.05 ppm (0.4 mg/m ³) [skin]
Carbon monoxide:	TWA 35 ppm (40 mg/m ³) C 200 ppm (229 mg/m ³)	Chlorodifluoromethane:	TWA 1000 ppm (3500 mg/m ³)
Carbon tetrabromide:	TWA 0.1 ppm (1.4 mg/m ³) ST 0.3 ppm (4 mg/m ³)	Chloroform:	TWA 2 ppm (9.78 mg/m ³)
Carbon tetrachloride:	TWA 2 ppm (12.6 mg/m ³)	1-Chloro-1-nitropropane:	TWA 2 ppm (10 mg/m ³)
Carbonyl fluoride:	TWA 2 ppm (5 mg/m ³) ST 5 ppm (15 mg/m ³)	Chloropentafluoroethane:	TWA 1000 ppm (8320 mg/m ³)
Catechol:	TWA 5 ppm (20 mg/m ³) [skin]	β-Chloroprene:	TWA 10 ppm (35 mg/m ³) [skin]
		o-Chlorostyrene:	TWA 50 ppm (285 mg/m ³) ST 75 ppm (428 mg/m ³)
		o-Chlorotoluene:	TWA 50 ppm (250 mg/m ³)

APPENDIX G—VACATED 1989 OSHA PELs (Continued)

Chlorpyrifos:	TWA 0.2 mg/m ³ [skin]	Cyhexatin:	TWA 5 mg/m ³
Coal dust:	TWA 2 mg/m ³ (<5% SiO ₂) (resp dust) TWA 0.1 mg/m ³ (≥5% SiO ₂) (resp quartz)	Decaborane:	TWA 0.3 mg/m ³ (0.05 ppm) ST 0.9 mg/m ³ (0.15 ppm) [skin]
Cobalt metal dust & fume, as Co:	TWA 0.05 mg/m ³	Diazinon®:	TWA 0.1 mg/m ³ [skin]
Cobalt carbonyl (as Co):	TWA 0.1 mg/m ³	2-N-Dibutylaminoethanol:	TWA 2 ppm (14 mg/m ³)
Cobalt hydrocarbonyl (as Co):	TWA 0.1 mg/m ³	Dibutyl phosphate:	TWA 1 ppm (5 mg/m ³) ST 2 ppm (10 mg/m ³)
Crag® herbicide:	TWA 10 mg/m ³ (total) TWA 5 mg/m ³ (resp)	Dichloroacetylene:	C 0.1 ppm (0.4 mg/m ³)
Crotomate:	TWA 5 mg/m ³	p-Dichlorobenzene:	TWA 75 ppm (450 mg/m ³) ST 110 ppm (675 mg/m ³)
Cyanamide:	TWA 2 mg/m ³	1,3-Dichloro-5,5-dimethylhydantoin:	TWA 0.2 mg/m ³ ST 0.4 mg/m ³
Cyanogen:	TWA 10 ppm (20 mg/m ³)	Dichloroethyl ether:	TWA 5 ppm (30 mg/m ³) ST 10 ppm (60 mg/m ³) [skin]
Cyanogen chloride:	C 0.3 ppm (0.8 mg/m ³)	Dichloromonofluoromethane:	TWA 10 ppm (40 mg/m ³)
Cyclohexanol:	TWA 50 ppm (200 mg/m ³) [skin]	1,1-Dichloro-1-nitroethane:	TWA 2 ppm (10 mg/m ³)
Cyclohexanone:	TWA 25 ppm (100 mg/m ³) [skin]	1,3-Dichloropropene:	TWA 1 ppm (5 mg/m ³) [skin]
Cyclohexylamine:	TWA 10 ppm (40 mg/m ³)		
Cyclonite:	TWA 1.5 mg/m ³ [skin]		
Cyclopentane:	TWA 600 ppm (1720 mg/m ³)		

APPENDIX G—VACATED 1989 OSHA PELs (Continued)

2,2-Dichloropropionic acid:	TWA 1 ppm (6 mg/m ³)	Dimethyl sulfate:	TWA 0.1 ppm (0.5 mg/m ³) [skin]
Dicrotophos:	TWA 0.25 mg/m ³ [skin]	Dinitolmide:	TWA 5 mg/m ³
Dicyclopentadiene:	TWA 5 ppm (30 mg/m ³)	Di-sec octyl phthalate:	TWA 5 mg/m ³ ST 10 mg/m ³
Dicyclopentadienyl iron:	TWA 10 mg/m ³ (total) TWA 5 mg/m ³ (resp)	Dioxane:	TWA 25 ppm (90 mg/m ³) [skin]
Diethanolamine:	TWA 3 ppm (15 mg/m ³)	Dioxathion:	TWA 0.2 mg/m ³ [skin]
Diethylamine:	TWA 10 ppm (30 mg/m ³) ST 25 ppm (75 mg/m ³)	Diphenylamine:	TWA 10 mg/m ³
Diethylenetriamine:	TWA 1 ppm (4 mg/m ³)	Dipropylene glycol methyl ether:	TWA 100 ppm (600 mg/m ³) ST 150 ppm (900 mg/m ³) [skin]
Diethyl ketone:	TWA 200 ppm (705 mg/m ³)	Dipropyl ketone:	TWA 50 ppm (235 mg/m ³)
Diethyl phthalate:	TWA 5 mg/m ³	Diquat (Diquat dibromide):	TWA 0.5 mg/m ³
Diglycidyl ether:	TWA 0.1 ppm (0.5 mg/m ³)	Disulfiram:	TWA 2 mg/m ³
Diisobutyl ketone:	TWA 25 ppm (150 mg/m ³)	Disulfoton:	TWA 0.1 mg/m ³ [skin]
N,N-Dimethylaniline:	TWA 5 ppm (25 mg/m ³) ST 10 ppm (50 mg/m ³) [skin]	2,6-Di-tert-butyl-p-cresol:	TWA 10 mg/m ³
Dimethyl-1,2-dibromo-2,2-dichloroethyl phosphate:	TWA 3 mg/m ³ [skin]	Diuron:	TWA 10 mg/m ³
		Divinyl benzene:	TWA 10 ppm (50 mg/m ³)

APPENDIX G—VACATED 1989 OSHA PELs (Continued)

Emery:	TWA 10 mg/m ³ (total) TWA 5 mg/m ³ (resp)	Ethyl ether:	TWA 400 ppm (1200 mg/m ³) ST 500 ppm (1500 mg/m ³)
Endosulfan:	TWA 0.1 mg/m ³ [skin]	Ethylidene norbornene:	C 5 ppm (25 mg/m ³)
Epichlorohydrin:	TWA 2 ppm (8 mg/m ³) [skin]	Ethyl mercaptan:	TWA 0.5 ppm (1 mg/m ³)
Ethanolamine:	TWA 3 ppm (8 mg/m ³) ST 6 ppm (15 mg/m ³)	N-Ethylmorpholine:	TWA 5 ppm (23 mg/m ³) [skin]
Ethion:	0.4 mg/m ³ [skin]	Ethyl silicate:	TWA 10 ppm (85 mg/m ³)
Ethyl acrylate:	TWA 5 ppm (20 mg/m ³) ST 25 ppm (100 mg/m ³) [skin]	Fenamiphos:	TWA 0.1 mg/m ³ [skin]
Ethyl benzene:	TWA 100 ppm (435 mg/m ³) ST 125 ppm (545 mg/m ³)	Fensulfothion:	TWA 0.1 mg/m ³
Ethyl bromide:	TWA 200 ppm (890 mg/m ³) ST 250 ppm (1110 mg/m ³)	Fenthion:	TWA 0.2 mg/m ³ [skin]
Ethylene chlorohydrin:	C 1 ppm (3 mg/m ³) [skin]	Ferbam:	TWA 10 mg/m ³
Ethylene dichloride:	TWA 1 ppm (4 mg/m ³) ST 2 ppm (8 mg/m ³)	Ferrovanadium dust:	TWA 1 mg/m ³ ST 3 mg/m ³
Ethylene glycol:	C 50 ppm (125 mg/m ³)	Fluorotrichloromethane:	C 1000 ppm (5600 mg/m ³)
Ethylene glycol dinitrate:	ST 0.1 mg/m ³ [skin]	Fonofos:	TWA 0.1 mg/m ³ [skin]
		Formamide:	TWA 20 ppm (30 mg/m ³) ST 30 ppm (45 mg/m ³)
		Furfural:	TWA 2 ppm (8 mg/m ³) [skin]

APPENDIX G—VACATED 1989 OSHA PELs (Continued)

Furfuryl alcohol:	TWA 10 ppm (40 mg/m ³) ST 15 ppm (60 mg/m ³) [skin]	n-Hexane:	TWA 50 ppm (180 mg/m ³)
Gasoline:	TWA 300 ppm (900 mg/m ³) ST 500 ppm (1500 mg/m ³)	Hexane isomers (except n-Hexane):	TWA 500 ppm (1800 mg/m ³) ST 1000 ppm (3600 mg/m ³)
Germanium tetrahydride:	TWA 0.2 ppm (0.6 mg/m ³)	2-Hexanone:	TWA 5 ppm (20 mg/m ³)
Glutaraldehyde:	C 0.2 ppm (0.8 mg/m ³)	Hexone:	TWA 50 ppm (205 mg/m ³) ST 75 ppm (300 mg/m ³)
Glycerin (mist):	TWA 10 mg/m ³ (total) TWA 5 mg/m ³ (resp)	Hexylene glycol:	C 25 ppm (125 mg/m ³)
Glycidol:	TWA 25 ppm (75 mg/m ³)	Hydrazine:	TWA 0.1 ppm (0.1 mg/m ³) [skin]
Graphite (natural):	TWA 2.5 mg/m ³ (resp)	Hydrogenated terphenyls:	TWA 0.5 ppm (5 mg/m ³)
Graphite (synthetic):	TWA 10 mg/m ³ (total) TWA 5 mg/m ³ (resp)	Hydrogen bromide:	C 3 ppm (10 mg/m ³)
n-Heptane:	TWA 400 ppm (1600 mg/m ³) ST 500 ppm (2000 mg/m ³)	Hydrogen cyanide:	ST 4.7 ppm (5 mg/m ³) [skin]
Hexachlorobutadiene:	TWA 0.02 ppm (0.24 mg/m ³)	Hydrogen fluoride (as F):	TWA 3 ppm ST 6 ppm
Hexachlorocyclopentadiene:	TWA 0.01 ppm (0.1 mg/m ³)	Hydrogen sulfide:	TWA 10 ppm (14 mg/m ³) ST 15 ppm (21 mg/m ³)
Hexafluoroacetone:	TWA 0.1 ppm (0.7 mg/m ³) [skin]	2-Hydroxypropyl acrylate:	TWA 0.5 ppm (3 mg/m ³) [skin]
		Indene:	TWA 10 ppm (45 mg/m ³)

APPENDIX G—VACATED 1989 OSHA PELs (Continued)

Indium:	TWA 0.1 mg/m ³	Isopropyl alcohol:	TWA 400 ppm (980 mg/m ³) ST 500 ppm (1225 mg/m ³)
Iodoform:	TWA 0.6 ppm (10 mg/m ³)	Isopropylamine:	TWA 5 ppm (12 mg/m ³) ST 10 ppm (24 mg/m ³)
Iron pentacarbonyl (as Fe):	TWA 0.1 ppm (0.8 mg/m ³) ST 0.2 ppm (1.6 mg/m ³)	N-Isopropylaniline:	TWA 2 ppm (10 mg/m ³) [skin]
Iron salts (soluble, as Fe):	TWA 1 mg/m ³	Isopropyl glycidyl ether:	TWA 50 ppm (240 mg/m ³) ST 75 ppm (360 mg/m ³)
Isamyl alcohol (primary & secondary):	TWA 100 ppm (360 mg/m ³) ST 125 ppm (450 mg/m ³)	Kaolin:	TWA 10 mg/m ³ (total) TWA 5 mg/m ³ (resp)
Isobutane:	TWA 800 ppm (1900 mg/m ³)	Ketene:	TWA 0.5 ppm (0.9 mg/m ³) ST 1.5 ppm (3 mg/m ³)
Isobutyl alcohol:	TWA 50 ppm (150 mg/m ³)	Magnesium oxide fume:	TWA 10 mg/m ³
Isooctyl alcohol:	TWA 50 ppm (270 mg/m ³) [skin]	Malathion:	TWA 10 mg/m ³ [skin]
Isophorone:	TWA 4 ppm (23 mg/m ³)	Manganese compounds and fume (as Mn):	Compounds: C 5 mg/m ³ Fume: TWA 1 mg/m ³ ST 3 mg/m ³
Isophorone diisocyanate:	TWA 0.005 ppm ST 0.02 ppm [skin]	Manganese cyclopentadienyl tricarbonyl (as Mn):	TWA 0.1 mg/m ³ [skin]
2-Isopropoxyethanol:	TWA 25 ppm (105 mg/m ³)		
Isopropyl acetate:	TWA 250 ppm (950 mg/m ³) ST 310 ppm (1185 mg/m ³)		

APPENDIX G—VACATED 1989 OSHA PELs (Continued)

Manganese tetroxide (as Mn):	TWA 1 mg/m ³	Methylacrylonitrile:	TWA 1 ppm (3 mg/m ³) [skin]
Mercury compounds, as Hg [except(organo) alkyls]:	Hg Vapor: TWA 0.05 mg/m ³ [skin] Non-alkyl compounds: C 0.1 mg/m ³ [skin]	Methyl alcohol:	TWA 200 ppm (260 mg/m ³) ST 250 ppm (325 mg/m ³) [skin]
Mercury (organo) alkyl compounds (as Hg):	TWA 0.01 mg/m ³ ST 0.03 mg/m ³ [skin]	Methyl bromide:	TWA 5 ppm (20 mg/m ³) [skin]
Mesityl oxide:	TWA 15 ppm (60 mg/m ³) ST 25 ppm (100 mg/m ³)	Methyl chloride:	TWA 50 ppm (105 mg/m ³) ST 100 ppm (210 mg/m ³)
Methacrylic acid:	TWA 20 ppm (70 mg/m ³) [skin]	Methyl chloroform:	TWA 350 ppm (1900 mg/m ³) ST 450 ppm (2450 mg/m ³)
Methomyl:	TWA 2.5 mg/m ³	Methyl-2-cyanoacrylate:	TWA 2 ppm (8 mg/m ³) ST 4 ppm (16 mg/m ³)
Methoxychlor:	TWA 10 mg/m ³	Methylcyclohexane:	TWA 400 ppm (1600 mg/m ³)
4-Methoxyphenol:	TWA 5 mg/m ³	Methylcyclohexanol:	TWA 50 ppm (235 mg/m ³)
Methyl acetate:	TWA 200 ppm (610 mg/m ³) ST 250 ppm (760 mg/m ³)	o-Methylcyclohexanone:	TWA 50 ppm (230 mg/m ³) ST 75 ppm (345 mg/m ³) [skin]
Methyl acetylene-propadiene mixture	TWA 1000 ppm (1800 mg/m ³) ST 1250 ppm (2250 mg/m ³)	Methyl cyclopentadienyl manganese tricarbonyl (as Mn):	TWA 0.2 mg/m ³ [skin]
		Methyl demeton:	TWA 0.5 mg/m ³ [skin]

APPENDIX G—VACATED 1989 OSHA PELs (Continued)

4,4'-Methylenebis(2-chloroaniline):	TWA 0.02 ppm (0.22 mg/m ³) [skin]	Mica:	TWA 3 mg/m ³ (resp)
Methylene bis(4-cyclohexylisocyanate):	C 0.01 ppm (0.11 mg/m ³) [skin]	Molybdenum (insoluble compounds, as Mo):	TWA 10 mg/m ³
Methyl ethyl ketone peroxide:	C 0.7 ppm (5 mg/m ³)	Monocrotophos:	TWA 0.25 mg/m ³
Methyl formate:	TWA 100 ppm (250 mg/m ³) ST 150 ppm (375 mg/m ³)	Monomethyl aniline:	TWA 0.5 ppm (2 mg/m ³) [skin]
Methyl iodide:	TWA 2 ppm (10 mg/m ³) [skin]	Morpholine:	TWA 20 ppm (70 mg/m ³) ST 30 ppm (105 mg/m ³) [skin]
Methyl isoamyl ketone:	TWA 50 ppm (240 mg/m ³)	Naphthalene:	TWA 10 ppm (50 mg/m ³) ST 15 ppm (75 mg/m ³)
Methyl isobutyl carbinol:	TWA 25 ppm (100 mg/m ³) ST 40 ppm (165 mg/m ³) [skin]	Nickel metal & other compounds (as Ni):	Metal & insoluble compounds: TWA 1 mg/m ³ Soluble compounds: TWA 0.1 mg/m ³
Methyl isopropyl ketone:	TWA 200 ppm (705 mg/m ³)	Nitric acid:	TWA 2 ppm (5 mg/m ³) ST 4 ppm (10 mg/m ³)
Methyl mercaptan:	TWA 0.5 ppm (1 mg/m ³)	p-Nitroaniline:	TWA 3 mg/m ³ [skin]
Methyl parathion:	TWA 0.2 mg/m ³ [skin]	Nitrogen dioxide:	ST 1 ppm (1.8 mg/m ³)
Methyl silicate:	TWA 1 ppm (6 mg/m ³)	Nitroglycerine:	ST 0.1 mg/m ³ [skin]
α-Methyl styrene:	TWA 50 ppm (240 mg/m ³) ST 100 ppm (485 mg/m ³)	2-Nitropropane:	TWA 10 ppm (35 mg/m ³)
Metribuzin:	TWA 5 mg/m ³		

APPENDIX G—VACATED 1989 OSHA PELs (Continued)

Nitrotoluene (o-, m-, p-isomers):	TWA 2 ppm (11 mg/m ³) [skin]	Pentaerythritol:	TWA 10 mg/m ³ (total) TWA 5 mg/m ³ (resp)
Nonane:	TWA 200 ppm (1050 mg/m ³)	n-Pentane:	TWA 600 ppm (1800 mg/m ³) ST 750 ppm (2250 mg/m ³)
Octachloronaphthalene:	TWA 0.1 mg/m ³ ST 0.3 mg/m ³ [skin]	2-Pentanone:	TWA 200 ppm (700 mg/m ³) ST 250 ppm (875 mg/m ³)
Octane:	TWA 300 ppm (1450 mg/m ³) ST 375 ppm (1800 mg/m ³)	Perchloryl fluoride:	TWA 3 ppm (14 mg/m ³) ST 6 ppm (28 mg/m ³)
Osmium tetroxide (as Os):	TWA 0.002 mg/m ³ (0.0002 ppm) ST 0.006 mg/m ³ (0.0006 ppm)	Petroleum distillates (naphtha):	TWA 400 ppm (1600 mg/m ³)
Oxalic acid:	TWA 1 mg/m ³ ST 2 mg/m ³	Phenothiazine:	TWA 5 mg/m ³ [skin]
Oxygen difluoride:	C 0.05 ppm (0.1 mg/m ³)	Phenyl glycidyl ether:	TWA 1 ppm (6 mg/m ³)
Ozone:	TWA 0.1 ppm (0.2 mg/m ³) ST 0.3 ppm (0.6 mg/m ³)	Phenyldiazine:	TWA 5 ppm (20 mg/m ³) ST 10 ppm (45 mg/m ³) [skin]
Paraffin wax fume:	TWA 2 mg/m ³	Phenylphosphine:	C 0.05 ppm (0.25 mg/m ³)
Paraquat:	TWA 0.1 mg/m ³ (resp) [skin]	Phorate:	TWA 0.05 mg/m ³ ST 0.2 mg/m ³ [skin]
Pentaborane:	TWA 0.005 ppm (0.01 mg/m ³) ST 0.015 ppm (0.03 mg/m ³)	Phosdrin:	TWA 0.01 ppm (0.1 mg/m ³) ST 0.03 ppm (0.3 mg/m ³) [skin]

APPENDIX G—VACATED 1989 OSHA PELs (Continued)

Phosphine:	TWA 0.3 ppm (0.4 mg/m ³) ST 1 ppm (1 mg/m ³)	Propargyl alcohol:	TWA 1 ppm (2 mg/m ³) (skin)
Phosphoric acid:	TWA 1 mg/m ³ ST 3 mg/m ³	Propionic acid:	TWA 10 ppm (30 mg/m ³)
Phosphorus oxychloride:	TWA 0.1 ppm (0.6 mg/m ³)	Propoxur:	TWA 0.5 mg/m ³
Phosphorus pentasulfide:	TWA 1 mg/m ³ ST 3 mg/m ³	n-Propyl acetate:	TWA 200 ppm (840 mg/m ³) ST 250 ppm (1050 mg/m ³)
Phosphorus trichloride:	TWA 0.2 ppm (1.5 mg/m ³) ST 0.5 ppm (3 mg/m ³)	n-Propyl alcohol:	TWA 200 ppm (500 mg/m ³) ST 250 ppm (625 mg/m ³)
Phthalic anhydride:	TWA 6 mg/m ³ (1 ppm)	Propylene dichloride:	TWA 75 ppm (350 mg/m ³) ST 110 ppm (510 mg/m ³)
m-Phthalodinitrile:	TWA 5 mg/m ³ TWA 10 mg/m ³ (total)	Propylene glycol dinitrate:	TWA 0.05 ppm (0.3 mg/m ³)
Picloram:	TWA 5 mg/m ³ (resp)	Propylene glycol monomethyl ether:	TWA 100 ppm (360 mg/m ³) ST 150 ppm (540 mg/m ³)
Piperazine dihydrochloride:	TWA 5 mg/m ³	Propylene oxide:	TWA 20 ppm (50 mg/m ³)
Platinum metal (as Pt):	TWA 1 mg/m ³	n-Propyl nitrate:	TWA 25 ppm (105 mg/m ³) ST 40 ppm (170 mg/m ³)
Portland cement:	TWA 10 mg/m ³ (total) TWA 5 mg/m ³ (resp)	Resorcinol:	TWA 10 ppm (45 mg/m ³) ST 20 ppm (90 mg/m ³)
Potassium hydroxide:	TWA 2 mg/m ³	Ronnel:	TWA 10 mg/m ³

APPENDIX G—VACATED 1989 OSHA PELs (Continued)

Rosin core solder, pyrolysis products (as formaldehyde):	TWA 0.1 mg/m ³	Sodium azide:	C 0.1 ppm (as HN ₃) [skin] C 0.3 mg/m ³ (as NaN ₃) [skin]
Rouge:	TWA 10 mg/m ³ (total) TWA 5 mg/m ³ (resp)	Sodium bisulfite:	TWA 5 mg/m ³
Silica, amorphous:	TWA 6 mg/m ³	Sodium fluoroacetate:	TWA 0.05 mg/m ³ ST 0.15 mg/m ³ [skin]
Silica, crystalline (as respirable dust):	TWA 0.05 mg/m ³ (cristobalite) TWA 0.05 mg/m ³ (tridymite) TWA 0.1 mg/m ³ (quartz) TWA 0.1 mg/m ³ (tripoli) TWA 0.1 mg/m ³ (fused)	Sodium hydroxide:	C 2 mg/m ³
Silicon:	TWA 10 mg/m ³ (total) TWA 5 mg/m ³ (resp)	Sodium metabisulfite:	TWA 5 mg/m ³
Silicon carbide:	TWA 10 mg/m ³ (total) TWA 5 mg/m ³ (resp)	Stoddard solvent:	TWA 525 mg/m ³ (100 ppm)
Silicon tetrahydride:	TWA 5 ppm (7 mg/m ³)	Styrene:	TWA 50 ppm (215 mg/m ³) ST 100 ppm (425 mg/m ³)
Soapstone:	TWA 6 mg/m ³ (total) TWA 3 mg/m ³ (resp)	Subtilisins:	ST 0.00006 mg/m ³ [60-minute]
		Sulfur dioxide:	TWA 2 ppm (5 mg/m ³) ST 5 ppm (13 mg/m ³)
		Sulfur monochloride:	C 1 ppm (6 mg/m ³)
		Sulfur pentafluoride:	C 0.01 ppm (0.1 mg/m ³)
		Sulfur tetrafluoride:	C 0.1 ppm (0.4 mg/m ³)

APPENDIX G—VACATED 1989 OSHA PELs (Continued)

Sulfuryl fluoride:	TWA 5 ppm (20 mg/m ³) ST 10 ppm (40 mg/m ³)	Tin(II) oxide (as Sn):	TWA 2 mg/m ³
Sulprofos:	TWA 1 mg/m ³	Tin(IV) oxide (as Sn):	TWA 2 mg/m ³
Talc:	TWA 2 mg/m ³ (resp)	Titanium dioxide:	TWA 10 mg/m ³
Temephos:	TWA 10 mg/m ³ (total) TWA 5 mg/m ³ (resp)	Toluene:	TWA 100 ppm (375 mg/m ³) ST 150 ppm (560 mg/m ³)
Terphenyl (o-, m-, p-isomers):	C 5 mg/m ³ (0.5 ppm)	Toluene-2,4-diisocyanate:	TWA 0.005 ppm (0.04 mg/m ³) ST 0.02 ppm (0.15 mg/m ³)
1,1,2,2-Tetrachloroethane:	TWA 1 ppm (7 mg/m ³) [skin]	m-Toluidine:	TWA 2 ppm (9 mg/m ³) [skin]
Tetrachloroethylene:	TWA 25 ppm (170 mg/m ³)	p-Toluidine:	TWA 2 ppm (9 mg/m ³) [skin]
Tetrahydrofuran:	TWA 200 ppm (590 mg/m ³) ST 250 ppm (735 mg/m ³)	Tributyl phosphate:	TWA 0.2 ppm (2.5 mg/m ³)
Tetrasodium pyrophosphate:	TWA 5 mg/m ³	Trichloroacetic acid:	TWA 1 ppm (7 mg/m ³)
4,4'-Thiobis(6-tert-butyl-m-cresol):	TWA 10 mg/m ³ (total) TWA 5 mg/m ³ (resp)	1,2,4-Trichlorobenzene:	C 5 ppm (40 mg/m ³)
Thioglycolic acid:	TWA 1 ppm (4 mg/m ³) [skin]	Trichloroethylene:	TWA 50 ppm (270 mg/m ³) ST 200 ppm (1080 mg/m ³)
Thionyl chloride:	C 1 ppm (5 mg/m ³)	1,2,3-Trichloropropane:	TWA 10 ppm (60 mg/m ³)
Tin (organic compounds, as Sn):	TWA 0.1 mg/m ³ [skin]	1,1,2-Trichloro-1,2,2-trifluoroethane:	TWA 1000 ppm (7600 mg/m ³) ST 1250 ppm (9500 mg/m ³)

APPENDIX G—VACATED 1989 OSHA PELs (Continued)

Triethylamine:	TWA 10 ppm (40 mg/m ³) ST 15 ppm (60 mg/m ³)	Tungsten carbide (cemented):	TWA 5 mg/m ³ (as W) ST 10 mg/m ³ (as W)
Trimellitic anhydride:	TWA 0.005 ppm (0.04 mg/m ³)		TWA 0.05 mg/m ³ (as Co) TWA 1 mg/m ³ (as Ni)
Trimethylamine:	TWA 10 ppm (24 mg/m ³) ST 15 ppm (36 mg/m ³)	Uranium (insoluble compounds, as U):	TWA 0.2 mg/m ³ ST 0.6 mg/m ³
1,2,3-Trimethylbenzene:	TWA 25 ppm (125 mg/m ³)	n-Valeraldehyde:	TWA 50 ppm (175 mg/m ³)
1,2,4-Trimethylbenzene:	TWA 25 ppm (125 mg/m ³)	Vanadium dust:	TWA 0.05 mg V ₂ O ₅ /m ³ (resp)
1,3,5-Trimethylbenzene:	TWA 25 ppm (125 mg/m ³)	Vanadium fume:	C 0.05 mg V ₂ O ₅ /m ³
Trimethyl phosphite:	TWA 2 ppm (10 mg/m ³)	Vinyl acetate:	TWA 10 ppm (30 mg/m ³) ST 20 ppm (60 mg/m ³)
2,4,6-Trinitrotoluene:	TWA 0.5 mg/m ³ [skin]	Vinyl bromide:	TWA 5 ppm (20 mg/m ³)
Triorthocresyl phosphate:	TWA 0.1 mg/m ³ [skin]	Vinyl cyclohexene dioxide:	TWA 10 ppm (60 mg/m ³) [skin]
Triphenylamine:	TWA 5 mg/m ³	Vinylidene chloride:	TWA 1 ppm (4 mg/m ³)
Tungsten (insoluble compounds, as W):	TWA 5 mg/m ³ ST 10 mg/m ³	VM & P Naphtha:	TWA 1350 mg/m ³ (300 ppm) ST 1800 mg/m ³ (400 ppm)
Tungsten (soluble compounds, as W):	TWA 1 mg/m ³ ST 3 mg/m ³	Welding fumes:	TWA 5 mg/m ³

APPENDIX G—VACATED 1989 OSHA PELs (Continued)

Wood dust (all wood dusts except Western red cedar):	TWA 5 mg/m ³ ST 10 mg/m ³	Zinc oxide:	TWA 5 mg/m ³ (fume) ST 10 mg/m ³ (fume)
Wood dust (Western red cedar):	TWA 2.5 mg/m ³		TWA 10 mg/m ³ (total dust) TWA 5 mg/m ³ (resp dust)
Xylene (o-, m-, p-isomers):	TWA 100 ppm (435 mg/m ³) ST 150 ppm (655 mg/m ³)	Zinc stearate:	TWA 10 mg/m ³ (total) TWA 5 mg/m ³ (resp)
m-Xylene α,α'-diamine:	C 0.1 mg/m ³ [skin]	Zirconium compounds (as Zr):	TWA 5 mg/m ³ ST 10 mg/m ³
Xylidine:	TWA 2 ppm (10 mg/m ³) [skin]		
Zinc chloride fume:	TWA 1 mg/m ³ ST 2 mg/m ³		

SYNONYM AND TRADE NAME INDEX

Abate®, 296
Acetylene dichloride, 98
Acetyl mercaptan, 306
Acridine, 74
Actinolite, 22
Activated carbon, 154
AGE, 10
Aluminum oxide, 12, 126
Aluminum trioxide, 12, 126
ortho- or para-Aminoanisole, 18
Aminobenzene, 18
4- or p-Aminobiphenyl, 14
1-Aminobutane, 40
Aminocyclohexane, 84
Aminodimethylbenzene, 336
Aminoethane, 132
2-Aminoethanol, 128
Aminoethylene, 138
Aminomethane, 200
1- or 2-Aminonaphthalene, 222
2-Aminopropane, 180
Aminotoluene, 312

Aminotriazole, 14
Ammate® herbicide, 16
Amosite, 22
Amyl aldehyde, 326
Amyl ethyl ketone, 210
Amyl mercaptan, 244
Amyl methyl ketone, 200
Antabuse®, 122
Anthophyllite, 22
Anthracene, 74
Antimony trihydride, 284
Aroclor® 1242, 64
Aroclor® 1254, 64
Aspirin, 6
Azide, 280
Azodrin®, 218
Azomethylene, 92
Azophos®, 214
Bacillus subtilis, 286
Banana oil, 174
Barte, 24

SYNONYM AND TRADE NAME INDEX (Continued)

Barytes, 24
 Baygon®, 266
 BCME, 64
 1,4-Benzenediamine, 248
 1,2- or o-Benzenediol, 56
 1,3- or m-Benzenediol, 272
 1,4- or p-Benzenediol, 170
 Benzidine-based dyes, 26
 Benzol, 26
 Benzo(a)pyrene, 74
 Benzoperoxide, 26
 1,4- or p-Benzoquinone, 272
 BGE, 42
 Biphenyl, 120
 Borax, 30
 Borax decahydrate, 30
 Borax pentahydrate, 30
 Boroethane, 92
 Boron hydride, 92
 Bromochloromethane, 62
 Bromoethane, 134
 Bromoethylene, 330

Bromomethane, 200
 Bromotrifluoromethane, 318
 Butanedinitrile, 288
 Butanenitrile, 44
 Butanethiol, 42
 1- or n-Butanol, 38
 2-Butanol, 40
 2-Butenal, 80
 Butyl Cellosolve®, 36
 Butyl Cellosolve® acetate, 36
 Butyl ethanoate, 36
 Butyl ethyl ketone, 134
 Butyl methyl ketone, 164
 Butyl phosphate, 314
 Butyl 2-propenoate, 38
 Butyraldehyde, 345
 Cadmium monoxide, 44
 Cadmium oxide fume, 44
 Calcium carbonate, 186, 192
 Calcium hydrate, 46
 Calcium(II) sulfate dihydrate, 154

SYNONYM AND TRADE NAME INDEX (Continued)

Carbimide, 80
Carbon oxyfluoride, 54
Carbon tet, 54
Carbonyl chloride, 252
Carborundum®, 278
Caustic lime, 46
Caustic soda, 284
Cellosolve®, 130
Cellosolve® acetate, 130
Cemented tungsten carbide, 324
Cesium hydrate, 56
Cetyl mercaptan, 160
CFC 113, 316
Chlorine cyanide, 82
Chlorine oxyfluoride, 248
Chloroacetic chloride, 60
Chlorobutadiene, 68
2-Chloro-1,3-butadiene, 68
Chlorocyanide, 82
1-Chloro-2,3-epoxypropane, 128
Chloroethane, 134

2-Chloroethanal, 60
2-Chloroethanol, 134
2-Chloroethyl alcohol, 134
Chloroethylene, 330
Chlorofluorocarbon 113, 316
Chloromethane, 202
1-Chloro-2-methylbenzene, 68
Chloromethyl phenyl ketone, 60
4- or p-Chloronitrobenzene, 226
3-Chloropropene, 10
3-Chloropropylene, 10
Chlorotrifluoride, 60
Chromic anhydride, 70
Chromic oxide, 70
Chromic oxychloride, 72
Chromium trioxide, 70
Chrysene, 74
Chrysotile, 22
Cinerin I or II, 270
Clay, 182
Coal tar, 74

Cobalt octacarbonyl, 74
 Copper(II) oxide, 76
 Corundum, 126
 Coyden®, 72
 Creosote, 74
 o-Cresylic acid, 78
 Cristobalite, 278
 Crocidolite, 22
 Cryocide, 280
 Cryolite, 280
 Cupric oxide, 76
 Cyanamide, 46, 80
 Cyanides, 168, 262, 282
 Cyanoacetonitrile, 190
 Cyanohydrin-2-propanone, 4
 Cyanomethane, 4
 Cyanomethanol, 152
 1-Cyanopropane, 44
 Cyclohexyl alcohol, 84
 Cyclohexyl ketone, 84
 Cyclohexylmercaptan, 82

SYNONYM AND TRADE NAME INDEX (Continued)

Cyclohexylmethane, 204
 Dasanit®, 142
 DBCP, 92
 DDVP, 102
 Decylmercaptan, 88
 DEHP, 118
 DEK, 106
 Delnav®, 120
 DGE, 108
 1,4- or p-Diaminobenzene, 248
 1,2-Diaminoethane, 136
 1,3-Diamino-4-methoxy benzene, 90
 Diaminotoluene, 310
 Diatomaceous earth, 276
 DIBK, 108
 Dibrom, 114
 Dibromodifluoromethane, 108
 1,2-Dibromoethane, 136
 Dichlorodiphenyltrichloroethane, 88
 1,2-Dichloroethane, 136
 1,1-Dichloroethylene, 332

SYNONYM AND TRADE NAME INDEX (Continued)

Dichloroethyne, 94
 Dichlorofluoromethane, 100
 Dichloromethane, 208
 Dichloromethyl ether, 64
 2,4-Dichlorophenoxyacetic acid, 88
 1,2-Dichloropropane, 268
 Dicyanomethane, 190
 Di(2,3-epoxypropyl) ether, 108
 Diethyl benzene, 124
 Diethylene dioxide, 120
 Diethylene oxide, 302
 Diethyl ether, 140
 Di(2-ethylhexyl) phthalate, 118
 Diethyl parathion, 240
 Difluorine monoxide, 238
 Difluorochloromethane, 62
 Difluorodichloromethane, 96
 1,1-Difluoroethylene, 332
 Difolatan®, 50
 Dihydroxybenzene, 170
 Diisopropyl ether, 182

3,3'-Dimethoxybenzidine, 90
 Dimethoxymethane, 198
 Dimethylacetone, 106
 Dimethylaminobenzene, 336
 Dimethylaniline, 112, 336
 Dimethylbenzene, 334, 336
 2,2- or 2,3-Dimethylbutane, 162
 2,6-Dimethyl-4-heptanone, 108
 Dimethylnitromethane, 230
 Dimethylnitrosoamine, 232
 N,N-Dimethylphenylamine, 112
 Dinitrogen monoxide, 234
 3,5-Dinitro-o-toluamide, 116
 Dioxin, 298
 DIPA, 110
 N,N-Diphenylaniline, 322
 Diphenylbenzene, 296, 298
 Diphenyl ether, 248
 4,4'-Diphenylmethane diisocyanate, 208
 Diphenyl oxide, 248
 Dipropylene glycol monobutyl ether, 122

Diquat dibromide, 122
 Disulfur decafluoride, 290
 DMCC, 112
 DMF, 114
 DNT, 118
 Dodecyl mercaptan, 126
 DOP, 118
 Dry ice, 52
 EGBE, 36
 EGBEA, 36
 EGDN, 138
 EGEE, 130
 EGEEA, 130
 EGME, 202
 EGMEA, 202
 1,2-Epoxy propane, 270
 2,3-Epoxy-1-propanol, 152
 2-Epoxypropyl ether, 108
 1,2-Ethanediamine, 136
 Ethanedinitrile, 82
 Ethane pentachloride, 242

SYNONYM AND TRADE NAME INDEX (Continued)

Ethanethiol, 140
 Ethanoic acid, 2
 Ethanoic anhydride, 2
 Ethanol, 132
 Ether, 140
 Ethine, 4
 Ethrane®, 128
 Ethyl acetone, 244
 Ethyl aldehyde, 2
 Ethyl amyl ketone, 210
 Ethyl cyanide, 266
 Ethylene dicyanide, 288
 Ethylene glycol monobutyl ether, 36
 Ethylene glycol monobutyl ether acetate, 36
 Ethylene glycol monoethyl ether, 130
 Ethylene glycol monoethyl ether acetate, 130
 Ethylene glycol monomethyl ether, 202
 Ethylene glycol monomethyl ether acetate, 202
 Ethylene trichloride, 316
 Ethylidene chloride, 98
 Ethyl methyl ketone, 36

SYNONYM AND TRADE NAME INDEX (Continued)

Ethyl parathion, 240
Ethyne, 4
Ferric oxide, 172
Ferrocene, 104
Fluorides (inorganic, solid), 280, 282
Fluorine, 282
Fluorine monoxide, 238
Fluorocarbon-12, 96
Fluorocarbon-22, 62
Fluorocarbon-115, 66
Fluorocarbon 1011, 62
Fluorocarbon 1301, 318
Fluorodichloromethane, 100
Fluoroethylene, 330
Fluorophosgene, 54
Freon® 10, 54
Freon® 11, 146
Freon® 12, 96
Freon® 21, 100
Freon® 22, 62
Freon® 112, 298

Freon® 112a, 298
Freon® 113, 316
Freon® 114, 102
Freon® 12B2, 108
Freon® 13B1, 318
Furadan®, 52
Furfuraldehyde, 150
Fused silica, 278
Genetron® 12, 96
Genetron® 21, 100
Genetron® 22, 62
Genetron® 113, 316
Genetron® 114, 102
Genetron® 115, 66
Germane, 150
Glycidyl phenyl ether, 250
Gyloxal, 345
Guthion®, 22
Halane, 98
Halocarbon 112, 298
Halocarbon 112a, 298

SYNONYM AND TRADE NAME INDEX (Continued)

Halocarbon 113, 316
 Halocarbon 113A, 332
 Halocarbon 115, 66
 Halocarbon 13B1, 318
 Halon® 104, 54
 Halon® 112, 100
 Halon® 122, 96
 Halon® 242, 102
 Halon® 1011, 62
 Halon® 1202, 108
 Halon® 1301, 318
 Halowax®, 300, 316
 Halowax® 1013, 242
 Halowax® 1014, 160
 Halowax® 1051, 234
 Hemimellitene, 320
 2-Heptanone, 200
 3-Heptanone, 134
 4-Heptanone, 122
 Heptyl mercaptan, 158
 Hexadecyl mercaptan, 160

Hexanedinitrile, 8
 Hexyl mercaptan, 162
 HMDI, 160
 Hydrated lime, 46
 Hydrobromic acid, 166
 Hydrochloric acid, 166
 Hydrocobalt tetracarbonyl, 74
 Hydrofluoric acid, 168
 Hydrogenated MDI, 206
 Hydrogen cyanamide, 80
 Hydrogen phosphide, 254
 Hydroxyacetoneitrile, 152
 Hydroxybenzene, 248
 4-Hydroxy-4-methyl-2-pentanone, 90
 2-Hydroxyphenol, 56
 IGE, 182
 Inert dusts, 240
 Iodomethane, 210
 Iron dicyclopentadienyl, 104
 Iron(III) oxide, 172, 276
 Isoamyl methyl ketone, 212

SYNONYM AND TRADE NAME INDEX (Continued)

Isobutanol, 176
Isobutyl methyl ketone, 164
Isooctanol, 178
Isopentyl alcohol, 174
Isopentyl methyl ketone, 212
Isopropanol, 180
Isopropyl benzene, 80
Isopropyl cyanide, 178
Isopropyl methyl ketone, 212
Jasmolin I or II, 270
Lannate®, 194
Laughing gas, 234
Lauryl mercaptan, 126
Lime, 48
Liquefied petroleum gas, 186
Lye, 262, 284
Mace®, 60
Magnesium carbonate, 188
Manmade mineral fibers, 216
MAPP gas, 198
MBK, 164

MBOCA, 206
MDA, 208
MDI, 208
MEK, 36
MEKP, 208
MEK peroxide, 208
Mesitylene, 320
Methacrylonitrile, 198
Methane tetrabromide, 54
Methanethiol, 214
Methane trichloride, 64
Methanoic acid, 148
Methanol, 200
o- or p-Methoxyaniline, 18
2-Methoxyethanol, 202
2-Methoxyethyl acetate, 202
2-Methoxy-1-methylethanol, 268
Methyl acetic acid, 266
(Methylamino)benzene, 218
Methyl amyl alcohol, 212
2-, 3-, or 4-Methylaniline, 312

SYNONYM AND TRADE NAME INDEX (Continued)

- Methyl azinphos, 22
Methyl benzene, 310
3-Methyl-2-butanol, 176
3-Methyl-2-butanone, 212
1-Methylbutyl acetate, 16
Methyl butyl ketone, 164
Methyl chlorobromide, 62
Methylchloromethyl ether, 66
Methyl cyanide, 4
Methyl dinitrobenzene, 118
Methylene dichloride, 208
Methylene dimethyl ether, 198
Methyl ethyl ketone, 36
2-Methyl-5-hexanone, 212
Methyl isobuteryl ketone, 194
Methyl isobutyl ketone, 164
4-Methyl-2-pentanone, 164
4-Methyl phenol, 78
1-Methyl-1-phenylethylene, 216
Methyl phosphite, 320
2-Methylpropane, 176
2-Methyl-2-propanol, 40
1-Methylpropyl acetate, 38
Methyl propyl ketone, 244
Methylstyrene, 332
Methyl sulfate, 116
Methyl systox®, 206
Methyl tribromide, 34
Mevinphos, 252
MIBK, 164
Mineral spirits, 286
MIPK, 212
MOCA, 206
Monobromoethane, 200
Monochloroethane, 134
Monochloromethane, 202
Monoethanolamine, 128
Monoethylamine, 132
Monomethylamine, 200
Monomethylhydrazine, 210
Monoxide, 54
MPK, 244

SYNONYM AND TRADE NAME INDEX (Continued)

Naked, 114
 β -Naphthylphenylamine, 250
 1- or α -Naphthyl thiourea, 20
 Nickel tetracarbonyl, 222
 Nitrapyrin, 68
 Nitrochloroform, 66
 4- or p-Nitrodiphenyl, 226
 Nitrogen lime, 46
 Nitrogen monoxide, 224
 β -Nitronaphthalene, 230
 p-Nitrophenylamine, 226
 Nitrotrichloromethane, 66
 n-Nonyl mercaptan, 234
 Nonylthiol, 234
 Nuisance dusts, 240
 OCBM, 62
 Octalene, 8
 n-Octyl mercaptan, 236
 Octyl phthalate, 118
 Octylthiol, 236
 Onion oil, 10

Osmium oxide, 238
 Paraformaldehyde, 345
 Parathion methyl, 214
 PCB, 64
 PCP, 242
 Pentacarbonyl iron, 174
 Pentachlorophosphorus, 256
 Pentamethylene, 88
 1- or 2-Pentanol acetate, 18
 3-Pentanone, 106
 Penthrane, 196
 Pentyl mercaptan, 244
 Perchloroethylene, 300
 Peroxide, 168
 Petroleum naphtha, 246
 Petroleum solvent, 286
 Petroleum spirit, 332
 PGE, 250
 Phenacyl chloride, 60
 Phenamiphos, 142
 Phenanthrene, 74

Phenyl alcohol, 248
 Phenylamine, 18
 Phenylaniline, 120
 Phenyl benzene, 120
 2- or 3-Phenylbiphenyl, 296
 4-Phenylbiphenyl, 298
 Phenyl chloride, 62
 Phenylethane, 132
 Phenylethylene, 286
 Phenyl mercaptan, 26
 Phenyl methane, 310
 4- or p-Phenylnitrobenzene, 226
 Phenyl phosphate, 322
 2-Phenyl propane, 80
 2-Phenyl propylene, 216
 Phosphorus trihydride, 254
 Phosphoryl chloride, 254
 Pivalol, 258
 2-Pivalyl-1,3-inandione, 258
 Polychlorinated biphenyl, 64
 Precipitated amorphous silica, 276
 Primatol, 22

SYNONYM AND TRADE NAME INDEX (Continued)

Propanedial, 190
 1- or n-Propanol, 268
 2-Propanol, 180
 2-Propanone, 2
 Propellant 12, 96
 Propenal, 6
 Propenamide, 6
 Propenenitrile, 8
 2-Propenoic acid, 8
 Propenol, 10
 Propionaldehyde, 345
 Propionaldehyde, 345
 Propyl allyl disulfide, 10
 2-Propylamine, 180
 Propyl cyanide, 44
 Propyl mercaptan, 264
 Propyne, 196
 Proteolytic enzymes, 286
 Pseudocumene, 320
 Pyrene, 74
 Pyrethrin I or II, 270

SYNONYM AND TRADE NAME INDEX (Continued)

Pyrocatechol, 56
 Pyrophosphate, 304
 Quartz, 278
 Quicksilver, 192
 RDX, 86
 Refrigerant 11, 146
 Refrigerant 12, 96
 Refrigerant 21, 100
 Refrigerant 22, 62
 Refrigerant 112, 298
 Refrigerant 112a, 298
 Refrigerant 113, 316
 Refrigerant 114, 102
 Refrigerant 13B1, 318
 Rockwool, 216
 Rubbing alcohol, 180
 Sal ammoniac fume, 16
 Selenium dihydride, 168
 Sesone, 78
 Sevin®, 50
 Sewer gas, 170

Silane, 278
 Silica gel, 276
 Silica (fused), 278
 Slag wool, 216
 Slaked lime, 46
 Soda lye, 284
 Spectracide®, 92
 Stannic oxide, 308
 Stannous oxide, 308
 Stibium, 18
 Sulfamate, 16
 Sulfatepp, 294
 Sulfurous oxychloride, 306
 Synthetic vitreous fibers, 216
 Systox®, 90
 TCDD, 298
 TDA, 310
 TDI, 312
 Tear gas, 60
 Telone®, 100
 Tetrabromoethane, 6

SYNONYM AND TRADE NAME INDEX (Continued)

- Tetrabromomethane, 54
 Tetrachloromethane, 54
 Tetraethyl pyrophosphate, 296
 Tetraethyl silicate, 142
 Tetramethoxysilane, 214
 Tetramethylene oxide, 302
 Tetramethyl silicate, 214
 THF, 302
 Thiodemeton, 124
 Thiodiphenylamine, 248
 Thiophenol, 26
 TNT, 322
 Toluol, 310
 Toxaphene, 58
 Tremolite, 22
 Tribromoborane, 32
 Tribromomethane, 34
 Tricalcium arsenate, 46
 1,1,1-Trichloroethane, 202
 Trichlorofluoromethane, 146
 Trichloromethane, 64
 Trichloronitromethane, 66
 Tricyclohexyltin hydroxide, 86
 Trifluoroborane, 32
 Triiodomethane, 172
 Triene, 316
 Trimethoxyphosphine, 320
 Trimethylenetrinitramine, 86
 Tridymite, 278
 Trinitroglycerine, 228
 2,4,6-Trinitrophenol, 258
 Trioxychlorofluoride, 246
 Tripoli, 278
 Undecyl mercaptan, 326
 Vanadium carbide, 144
 Vanadium metal, 144
 Varnish makers' & painters' naphtha, 332
 Vinyl benzene, 286
 Vinyl carbinol, 10
 Vinyl cyanide, 8
 Vinyl ethylene, 34
 Vinylstyrene, 124
 Wolfram, 324

SYNONYM AND TRADE NAME INDEX (Continued)

Wollastonite, 48
Xylol, 334, 336
Zinc chromate, 70
Zinc dichloride fume, 338
Zinc peroxide, 338

CAS NUMBER INDEX

50-00-0: 148	62-53-3: 18	74-83-9: 200	75-21-8: 138
50-29-3: 88	62-73-7: 102	74-86-2: 4	75-25-2: 34
50-78-2: 6	62-74-8: 282	74-87-3: 202	75-28-5: 176
53-96-3: 4	62-75-9: 232	74-88-4: 210	75-31-0: 180
54-11-5: 224	63-25-2: 50	74-89-5: 200	75-34-3: 98
55-38-9: 144	64-17-5: 132	74-90-8: 168	75-35-4: 332
55-63-0: 228	64-18-6: 148	74-93-1: 214	75-38-7: 332
56-23-5: 54	64-19-7: 2	74-96-4: 134	75-43-4: 100
56-38-2: 240	67-56-1: 200	74-97-5: 62	75-44-5: 252
56-81-5: 152	67-63-0: 180	74-98-6: 262	75-45-6: 62
57-14-7: 114	67-64-1: 2	74-99-7: 196	75-47-8: 172
57-24-9: 286	67-66-3: 64	75-00-3: 134	75-50-3: 318
57-50-1: 288	67-72-1: 158	75-01-4: 330	75-52-5: 230
57-57-8: 264	68-11-1: 306	75-02-5: 330	75-55-8: 270
57-74-9: 56	68-12-2: 114	75-04-7: 132	75-56-9: 270
58-89-9: 186	71-23-8: 268	75-05-8: 4	75-61-6: 108
60-11-7: 110	71-36-3: 38	75-07-0: 2	75-63-8: 318
60-29-7: 140	71-43-2: 26	75-08-1: 140	75-65-0: 40
60-34-4: 210	71-55-6: 202	75-09-2: 208	75-69-4: 146
60-57-1: 104	72-20-8: 126	75-12-7: 148	75-71-8: 96
61-82-5: 14	72-43-5: 194	75-15-0: 52	75-74-1: 302

CAS NUMBER INDEX (Continued)

75-86-5: 4	78-82-0: 178	83-79-4: 274	92-87-5: 26
75-99-0: 100	78-83-1: 176	84-15-1: 296	92-93-3: 226
76-01-7: 242	78-87-5: 268	84-66-2: 108	92-94-4: 298
76-03-9: 314	78-92-2: 40	84-74-2: 94	93-76-5: 292
76-06-2: 66	78-93-3: 36	85-00-7: 122	94-36-0: 26
76-11-9: 298	79-00-5: 314	85-44-9: 256	94-75-7: 88
76-12-0: 298	79-01-6: 316	86-50-0: 22	95-13-6: 170
76-13-1: 316	79-04-9: 60	86-88-4: 20	95-47-6: 334
76-14-2: 102	79-06-1: 6	87-68-3: 158	95-48-7: 78
76-15-3: 66	79-09-4: 266	87-86-5: 242	95-49-8: 68
76-22-2: 48	79-10-7: 8	88-72-2: 232	95-50-1: 96
76-38-0: 196	79-20-9: 196	88-89-1: 258	95-53-4: 312
76-44-8: 156	79-24-3: 228	89-72-5: 42	95-63-6: 320
77-47-4: 158	79-27-6: 6	90-04-0: 18	95-80-7: 310
77-73-6: 102	79-34-5: 300	91-20-3: 220	96-12-8: 92
77-78-1: 116	79-41-4: 194	91-59-8: 222	96-18-4: 316
78-00-2: 302	79-44-7: 112	91-94-1: 96	96-22-0: 106
78-10-4: 142	79-46-9: 230	92-06-8: 296	96-33-3: 198
78-30-8: 322	80-62-6: 214	92-52-4: 120	96-45-7: 138
78-34-2: 120	81-81-2: 334	92-67-1: 14	96-69-5: 306
78-59-1: 178	83-26-1: 258	92-84-2: 248	97-77-8: 122

CAS NUMBER INDEX

98-00-0: 150	101-77-9: 208	107-03-9: 264	108-05-4: 328
98-01-1: 150	101-84-8: 248	107-05-1: 10	108-10-1: 164
98-51-1: 44	102-54-5: 104	107-06-2: 136	108-11-2: 212
98-82-8: 80	102-81-8: 94	107-07-3: 134	108-18-9: 110
98-83-9: 216	104-94-9: 18	107-12-0: 266	108-20-3: 182
98-95-3: 226	105-46-4: 38	107-13-1: 8	108-21-4: 180
99-08-1: 232	105-60-2: 50	107-15-3: 136	108-24-7: 2
99-65-0: 116	106-35-4: 134	107-16-4: 152	108-31-6: 188
99-99-0: 232	106-42-3: 336	107-18-6: 10	108-38-3: 336
100-00-5: 226	106-44-5: 78	107-19-7: 264	108-39-4: 78
100-01-6: 226	106-46-7: 96	107-20-0: 60	108-44-1: 312
100-25-4: 118	106-49-0: 312	107-21-1: 136	108-46-3: 272
100-37-8: 106	106-50-3: 248	107-22-2: 345	108-67-8: 320
100-41-4: 132	106-51-4: 272	107-30-2: 66	108-83-8: 108
100-42-5: 286	106-87-6: 330	107-31-3: 210	108-84-9: 164
100-44-7: 28	106-89-8: 128	107-41-5: 164	108-87-2: 204
100-61-8: 218	106-92-3: 10	107-49-3: 296	108-88-3: 310
100-63-0: 250	106-93-4: 136	107-66-4: 94	108-90-7: 62
100-74-3: 142	106-97-8: 34	107-87-9: 244	108-91-8: 84
101-14-4: 206	106-99-0: 34	107-98-2: 268	108-93-0: 84
101-68-8: 208	107-02-8: 6	108-03-2: 230	108-94-1: 84

CAS NUMBER INDEX

108-95-2: 248
 108-98-5: 26
 109-59-1: 180
 109-60-4: 266
 109-66-0: 244
 109-73-9: 40
 109-74-0: 44
 109-77-3: 190
 109-79-5: 42
 109-86-4: 202
 109-87-5: 198
 109-89-7: 106
 109-94-4: 140
 109-99-9: 302
 110-12-3: 212
 110-19-0: 176
 110-43-0: 200
 110-49-6: 202
 110-54-3: 162
 110-61-2: 288
 110-62-3: 326

110-66-7: 244
 110-80-5: 130
 110-82-7: 82
 110-83-8: 84
 110-86-1: 272
 110-91-8: 220
 111-15-9: 130
 111-30-8: 152
 111-31-9: 162
 111-40-0: 106
 111-42-2: 104
 111-44-4: 98
 111-65-9: 236
 111-69-3: 8
 111-76-2: 36
 111-84-2: 234
 111-88-6: 236
 112-07-2: 36
 112-55-0: 126
 114-26-1: 266
 115-29-7: 126

115-77-5: 244
 115-86-6: 322
 115-90-2: 142
 117-81-7: 118
 118-52-5: 98
 118-96-7: 322
 119-90-4: 90
 119-93-7: 310
 120-80-9: 56
 120-82-1: 314
 121-44-8: 318
 121-45-9: 320
 121-69-7: 112
 121-75-5: 188
 121-82-4: 86
 122-39-4: 120
 122-60-1: 250
 123-19-3: 122
 123-31-9: 170
 123-38-6: 345
 123-42-2: 90

123-51-3: 174
 123-72-8: 345
 123-86-4: 36
 123-91-1: 120
 123-92-2: 174
 124-38-9: 52
 124-40-3: 110
 126-73-8: 314
 126-98-7: 198
 126-99-8: 68
 127-18-4: 300
 127-19-5: 110
 128-37-0: 124
 131-11-3: 114
 133-06-2: 50
 134-32-7: 222
 135-88-6: 250
 136-78-7: 78
 137-05-3: 204
 137-26-8: 306
 138-22-7: 42

140-88-5: 132
 141-32-2: 38
 141-43-5: 128
 141-66-2: 102
 141-78-6: 130
 141-79-7: 194
 142-64-3: 260
 142-82-5: 156
 143-10-2: 88
 143-33-9: 282
 143-50-0: 184
 144-62-7: 238
 148-01-6: 116
 150-76-5: 196
 151-50-8: 262
 151-56-4: 138
 151-67-7: 156
 156-62-7: 46
 287-92-3: 86
 298-00-0: 214
 298-02-2: 252

298-04-4: 124
 299-84-3: 274
 299-86-5: 80
 300-76-5: 114
 302-01-2: 166
 309-00-2: 8
 314-40-9: 32
 330-54-1: 124
 333-41-5: 92
 334-88-3: 92
 353-50-4: 54
 406-90-6: 146
 409-21-2: 278
 420-04-2: 80
 460-19-5: 82
 463-51-4: 184
 479-45-8: 304
 504-29-0: 14
 506-77-4: 82
 509-14-8: 304
 526-73-8: 320

CAS NUMBER INDEX

528-29-0: 116
 528-75-4: 176
 532-27-4: 60
 534-52-1: 118
 540-59-0: 98
 540-88-5: 38
 541-85-5: 210
 542-75-6: 100
 542-78-9: 190
 542-88-1: 64
 542-92-7: 86
 546-93-0: 188
 552-30-7: 318
 556-52-5: 152
 557-05-1: 338
 558-13-4: 54
 563-12-2: 130
 563-80-4: 212
 581-89-5: 230
 583-60-8: 204
 584-84-9: 312

591-78-6: 164
 593-60-2: 330
 594-42-3: 246
 594-72-9: 100
 600-25-9: 66
 603-34-9: 322
 615-05-4: 90
 624-67-9: 345
 624-83-9: 212
 626-17-5: 258
 626-38-0: 16
 627-13-4: 270
 628-63-7: 16
 628-96-6: 138
 630-08-0: 54
 630-20-6: 300
 638-21-1: 252
 680-31-9: 162
 681-84-5: 214
 684-16-2: 160
 768-52-5: 182

CAS NUMBER INDEX

822-06-0: 160	1317-38-0: 76	1738-25-6: 112	3173-72-6: 220
944-22-9: 146	1317-65-3: 46, 186, 192	1746-01-6: 298	3333-52-6: 302
999-61-1: 170	1321-64-8: 242	1910-42-5: 240	3383-96-8: 296
1120-71-4: 264	1321-65-9: 316	1912-24-9: 22	3689-24-5: 294
1189-85-1: 40	1321-74-0: 124	1918-02-1: 258	4016-14-2: 182
1300-73-8: 336	1330-43-4: 30	1929-82-4: 68	4098-71-9: 178
1302-74-5: 126	1332-21-4: 22	2039-87-4: 68	4170-30-3: 80
1303-86-2: 30	1332-58-7: 182	2104-64-5: 128	5124-30-1: 206
1303-96-4: 30	1333-82-0: 70	2179-59-1: 10	5332-52-5: 326
1304-82-1: 28	1333-86-4: 52	2234-13-1: 234	5714-22-7: 290
1305-62-0: 46	1335-87-1: 160	2238-07-5: 108	6423-43-4: 268
1305-78-8: 48	1335-88-2: 300	2425-06-1: 50	6923-22-4: 218
1306-19-0: 44	1338-23-4: 208	2426-08-6: 42	7429-90-5: 12
1309-37-1: 172, 276	1344-28-1: 12	2551-62-4: 288	7439-92-1: 184
1309-48-4: 188	1344-95-2: 48	2698-41-1: 62	7439-96-5: 190
1310-58-3: 262	1395-21-7: 286	2699-79-8: 292	7439-97-6: 192
1310-73-2: 284	1455-21-6: 234	2885-00-9: 236	7439-98-7: 218
1314-13-2: 338	1477-55-0: 336	2917-26-2: 160	7440-02-0: 224
1314-62-1: 328	1563-66-2: 52	2921-88-2: 70	7440-06-4: 260
1314-80-3: 256	1569-69-3: 82	2971-90-6: 72	7440-16-6: 272
1317-35-7: 192	1639-09-4: 158	3033-62-3: 112	7440-21-3: 278

CAS NUMBER INDEX

7440-22-4: 280	7616-94-6: 246	7778-18-9: 48	8001-35-2: 58
7440-25-7: 294	7631-86-9: 276	7778-44-1: 46	8002-05-9: 246
7440-31-5: 308	7631-90-5: 282	7782-41-4: 146	8002-74-2: 240
7440-33-7: 324	7637-07-2: 32	7782-42-5: 154	8003-34-7: 270
7440-36-0: 18	7646-85-7: 338	7782-49-2: 276	8004-13-5: 250
7440-38-2: 20	7647-01-0: 166	7782-50-5: 58	8006-61-9: 150
7440-44-0: 154	7664-38-2: 254	7782-65-2: 150	8006-64-2: 324
7440-41-7: 28	7664-39-3: 168	7783-06-4: 170	8008-20-6: 184
7440-43-9: 44	7664-41-7: 14	7783-07-5: 168	8012-95-1: 236
7440-47-3: 72	7664-93-9: 290	7783-41-7: 238	8022-00-2: 206
7440-48-4: 74	7681-49-4: 282	7783-54-2: 228	8030-30-6: 220
7440-50-8: 76	7681-57-4: 284	7783-60-0: 290	8032-32-4: 332
7440-58-6: 156	7697-37-2: 224	7783-79-1: 276	8052-41-3: 286
7440-61-1: 326	7719-09-7: 306	7783-80-4: 294	8052-42-4: 22
7440-65-5: 338	7719-12-2: 256	7784-42-1: 20	8065-48-3: 90
7440-67-7: 340	7722-84-1: 168	7786-34-7: 252	9004-34-6: 56
7440-74-6: 172	7722-88-5: 304	7789-30-2: 34	9005-25-8: 284
7446-09-5: 288	7723-14-0: 254	7790-91-2: 60	9014-01-1: 286
7553-56-2: 172	7726-95-6: 32	7803-51-2: 254	10022-31-8: 24
7572-29-4: 94	7727-43-7: 24	7803-52-3: 284	10024-97-2: 234
7580-67-8: 186	7773-06-0: 16	7803-62-5: 278	10025-67-9: 290

CAS NUMBER INDEX

10025-87-3: 254
 10026-13-8: 256
 10028-15-6: 238
 10035-10-6: 166
 10049-04-4: 56
 10102-43-9: 224
 10102-44-0: 228
 10210-68-1: 74
 10294-33-4: 32
 10361-37-2: 24
 11097-69-1: 64
 11107-01-0: 324
 12001-26-2: 216
 12079-65-1: 190
 12108-13-3: 206
 12125-02-9: 16
 12179-04-3: 30
 12415-34-8: 126
 12604-58-9: 144
 12718-69-3: 324
 13121-70-5: 86

13397-24-5: 154
 13463-39-3: 222
 13463-40-6: 174
 13463-67-7: 310
 13494-80-9: 294
 13838-16-9: 128
 14484-64-1: 144
 14807-96-6: 292
 14808-60-7: 278
 14977-61-8: 72
 15096-52-3: 280
 16219-75-3: 140
 16752-77-5: 194
 16842-03-8: 74
 17702-41-9: 88
 17804-35-2: 24
 18282-10-5: 308
 19287-45-7: 92
 19624-22-7: 242
 20816-12-0: 238
 21087-64-9: 216

21351-79-1: 56
 21651-19-4: 308
 22224-92-6: 142
 25013-15-4: 332
 25321-14-6: 118
 25376-45-8: 310
 25639-42-3: 204
 26499-65-0: 260
 26628-22-8: 280
 26952-21-6: 178
 30525-89-4: 345
 31242-93-0: 58
 34590-94-8: 122
 35400-43-2: 292
 37329-49-0: 324
 53469-21-9: 64
 59355-75-8: 198
 61788-32-7: 166
 62765-93-9: 222
 65996-93-2: 74
 65997-15-1: 262

68476-85-7: 186
 68956-68-3: 328
 93763-70-3: 246

DOT ID NUMBER INDEX

1001: 4	1051: 168	1098: 10	1157: 108
1005: 14	1052: 168	1100: 10	1158: 110
1008: 32	1053: 170	1104: 16	1159: 182
1009: 318	1060: 198	1105: 174, 176	1160: 110
1010: 34	1061: 200	1110: 200	1163: 114
1011: 34, 176	1062: 200	1111: 244	1165: 120
1013: 52	1063: 202	1114: 26	1170: 132
1016: 54	1064: 214	1120: 38, 40	1171: 130
1017: 58	1067: 228	1123: 36, 38	1172: 130
1018: 62	1070: 234	1125: 40	1173: 130
1020: 66	1075: 186	1131: 52	1175: 132
1026: 82	1076: 252	1134: 62	1184: 136
1028: 96	1079: 288	1135: 134	1185: 138
1029: 100	1080: 288	1143: 80	1188: 202
1032: 110	1083: 318	1145: 82	1189: 202
1036: 132	1085: 330	1146: 86	1190: 140
1037: 134	1086: 330	1148: 90	1193: 36
1040: 138	1089: 2	1150: 98	1198: 148
1045: 146	1090: 2	1154: 106	1199: 150
1048: 166	1092: 6	1155: 140	1203: 150
1050: 166	1093: 8	1156: 106	1204: 228

DOT ID NUMBER INDEX

1206: 156	1255: 246	1326: 156	1564: 24
1208: 162	1256: 220	1334: 220	1566: 28
1212: 176	1259: 222	1340: 256	1567: 28
1213: 176	1261: 230	1344: 258	1573: 46
1219: 180	1262: 236	1346: 278	1578: 226
1220: 180	1265: 244	1356: 322	1580: 66
1221: 180	1268: 286	1358: 340	1583: 66
1223: 184	1271: 332	1361: 72	1589: 82
1229: 194	1274: 268	1362: 154	1591: 96
1230: 200	1276: 268	1376: 172	1592: 96
1231: 196	1279: 268	1380: 242	1593: 208
1232: 36	1280: 270	1381: 254	1595: 116
1233: 164	1282: 272	1403: 46	1597: 116, 118
1234: 198	1292: 142	1414: 186	1598: 118
1235: 200	1294: 310	1446: 24	1600: 118
1239: 66	1296: 318	1463: 70	1604: 136
1243: 210	1297: 318	1510: 304	1605: 136
1244: 210	1299: 324	1516: 338	1613: 168
1245: 164	1301: 328	1541: 4	1648: 4
1247: 214	1303: 332	1547: 18	1649: 302
1249: 244	1307: 334, 336	1558: 20	1650: 222

DOT ID NUMBER INDEX

1651: 20	1710: 316	1823: 284	1915: 84
1654: 224	1711: 336	1824: 284	1916: 98
1660: 224	1715: 2	1828: 290	1917: 132
1661: 226	1738: 28	1830: 290	1918: 80
1662: 226	1744: 32	1831: 290	1919: 198
1664: 232	1745: 34	1832: 290	1920: 234
1669: 242	1749: 60	1836: 306	1921: 270
1670: 246	1752: 60	1839: 314	1932: 340
1671: 248	1755: 70	1845: 52	1940: 306
1673: 248	1758: 72	1846: 54	1941: 108
1680: 262	1760: 100, 220, 224	1848: 266	1958: 102
1687: 280	1779: 148	1860: 330	1959: 332
1689: 282	1788: 166	1865: 270	1978: 262
1690: 282	1789: 166	1868: 88	1986: 264
1692: 286	1790: 168	1885: 26	1991: 68
1697: 60	1805: 254	1887: 62	1993: 42, 84, 178
1702: 300	1806: 256	1888: 64	1994: 174
1704: 294	1809: 256	1891: 134	1999: 22
1707: 304	1810: 254	1897: 300	2008: 340
1708: 312	1813: 262	1910: 48	2014: 168
1709: 310	1814: 262	1911: 92	2015: 168

DOT ID NUMBER INDEX

2020: 242	2086: 26	2215: 188	2304: 220
2023: 128	2087: 26	2218: 8	2312: 248
2029: 166	2088: 26	2219: 10	2315: 64
2030: 166	2089: 26	2228: 42	2321: 314
2031: 224	2090: 26	2229: 42	2325: 320
2032: 224	2127: 208	2232: 60	2329: 320
2038: 118	2187: 52	2238: 68	2337: 26
2047: 100	2188: 20	2249: 64	2347: 42
2048: 102	2190: 238	2253: 112	2348: 38
2053: 212	2191: 292	2256: 84	2357: 84
2054: 220	2192: 150	2262: 112	2362: 98
2055: 286	2194: 276	2265: 114	2363: 140
2056: 302	2195: 294	2271: 210	2369: 36
2058: 326	2199: 254	2279: 158	2397: 212
2073: 14	2201: 234	2281: 160	2402: 264
2074: 6	2202: 168	2284: 178	2404: 266
2076: 78	2203: 278	2290: 178	2411: 44
2077: 222	2205: 8	2294: 218	2417: 54
2078: 312	2209: 148	2296: 204	2418: 290
2079: 106	2212: 22	2297: 204	2420: 160
2085: 26	2214: 256	2302: 212	2431: 18

DOT ID NUMBER INDEX

2451: 228	2677: 254	2761: 8, 58, 88, 104, 126,	2872: 92
2471: 238	2618: 332	156, 186, 194	2873: 94
2472: 258	2629: 282	2762: 56	2874: 150
2480: 212	2644: 210	2763: 22	2876: 272
2489: 208	2646: 158	2765: 88, 292	2929: 66
2491: 128	2647: 190	2771: 306	2979: 326
2504: 6	2650: 100	2781: 122	2984: 168
2515: 34	2658: 276	2782: 122	3018: 252
2516: 54	2662: 170	2783: 22, 70, 92, 102, 124,	3054: 82
2531: 194	2667: 44	130, 188, 214, 218,	3064: 228
2545: 156	2671: 14	240, 252, 296	3079: 198
2550: 208	2672: 14	2784: 240	3083: 246
2553: 220	2676: 284	2789: 2	9037: 158
2564: 314	2681: 56	2790: 2	9188: 16, 50, 114, 194
2570: 44	2682: 56	2805: 186	9192: 146
2572: 250	2686: 106	2809: 192	9202: 54
2574: 322	2692: 32	2821: 248	
2587: 272	2693: 282	2831: 202, 314	
2590: 22	2710: 122	2842: 228	
2606: 214	2717: 48	2862: 328	
2608: 230	2757: 24, 50, 52, 194	2871: 18	



NIOSH

Delivering on the Nation's promise:

**Safety and health at work
For all people
Through prevention**