DIVISION OF CHEMICAL HEALTH & SAFETY

001. INDOOR BEHAVIOR AND RISK ASSESSMENT FOLLOWING A SPACE SPRAYING.
Y. Matoba, Y. Takimoto and T. Kato, Sumitomo Chemical Co., Ltd.
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To clarify indoor behavior of insecticides applied by space spraying, an aerosol canister (0.45 g *d*-tetramethrin and 0.06 g *d*-resmethrin in 300 ml product) was applied to a typical Japanese room under various conditions. Air concentrations were chiefly dependent on ventilation rates. Dislodgeable residues on the floor decreased with time. By periodic spraying, airborne insecticides were not accumulated in the room, but floor residues gently increased with number of the spraying. The unsteady state behavior of *d*-tetramethrin was simulated by our developed simulation model and the estimated values agreed fully with measured values. Indoor exposure levels of *d*-tetramethrin and *d*-resmethrin to residents were estimated when a 10-sec spraying was done twice a day for 30 days. Margins of safety which were obtained by dividing the no-observed effect levels by the exposure levels were over 457 and 683 for a naked infant and adult, respectively, even in the windows-closed room.

002. PHOTODEGRADATION OF CARBAMATE: A STUDY ON KINETICS.
H. Zhong and Prof. Dr. W. Thiemann, Department of Chemistry, University of Bremen, D28334, Bremen, Germany

The generalized use of pesticides has lead to the need to eliminate them from the environment, and recent advanced oxidation processes provide a destructive and economical alternative to conventional treatment methods for the removal of these hazardous organic pollutants from groundwater and industrial wastewater. This study investigated the kinetics of three kinds of Carbamate oxidation in aqueous solutions by ultraviolet light and hydrogen peroxide. The reaction rate of Carbendazim, Carbofuran and Aldicarb was pseudo first order in individual concentration, and first order in hydrogen peroxide concentration at low peroxide levels, but independent of peroxide concentration at high peroxide levels. The effect of pH on the photodecomposition was also studied. A mechanism for their photooxidation was proposed which yielded a rate expression consistent with the experimental data.

003. DEVELOPMENT OF A WRITTEN COMPREHENSIVE CHEMICAL SAFETY PROGRAM

D.M. Sassone, Foster Wheeler Environmental Corporation, S.H. Holman, Emilcott/DGA, Inc., H.M. Whyte, and J.E. Shinkel, Los Alamos National Laboratory

It has become increasingly important for occupational safety and health (OSH) professionals to provide clear, definitive guidance to workers and supervisors on chemical safety. Internal OSH professionals find themselves in the role of consultants to their companies, providing "how-to's" to line personnel. This has resulted in a need to provide information for chemical safety that extends beyond an MSDS, especially where requirements/guidance may be duplicative or conflicting. Requirements are contained in OSHA, DOT and internal documents; guidance includes ANSI, ASTM, and NFPA. OSH personnel, workers and supervisors at Los Alamos National Laboratory (LANL), who must comply with DOE requirements, recognized the difficulty of complying with numerous regulations and guidelines. A document that resulted in "one-stop" shopping for chemical safety was proposed. This presentation describes our approach to simplifying chemical safety requirements and guidelines for LANL.

004.

A SAFETY MANUAL AND CHEMICAL HYGIENE PLAN (CHP) FOR A MULTIDISCIPLINARY LABORATORY
L. J. Doemeny B. R. Belinky and G. D. Foley National Institute for Occupational Safety and Health, 4676 Columbia Parkway, Cincinnati, Ohio 45226

The Division of Physical Sciences and Engineering (DPSE) of NIOSH had for many years a written Safety Manual. With the promulgation of OSHA standard 1910.1450, DPSE replaced the Safety Manual with a CHP in 1991; and revised it in 1995. Chemical, biological and ventilation engineering research is conducted.

General chemical research is conducted in the High Hazard Laboratory. Neat and concentrated carcinogens, dilute chemical agents and biological organisms are handled in the High Containment Laboratory. NIOSH scientists frequently conduct work site evaluations which include: office buildings, manufacturing plants, residences, road repair, foundries, mines, and hospitals. The CHP addresses chemical and biological organism inventories, hazard communication, evacuation, medical monitoring, project plan development, shop practices, chemical safety, biosafety, field studies and respirator fit testing. The CHP is the result of employee involvement and management's concern for employee and community health.

005. CHEMICAL HAZARD LABELING MADE EASY USING DESKTOP COMPUTERS
Jeffrey E. Schinkel, Alan K. Werner, and William R. Hargraves, Los Alamos National Laboratory, Mail Stop K486, Los Alamos, NM 87545

Accurate chemical hazard labeling is a cornerstone of every Hazard Communication program. A computerized methodology for developing, distributing, and printing chemical hazard labels has been developed for use with the Microsoft Windows and Macintosh operating systems. The methodology uses standardized Material Safety Data Sheets (MSDSs) to determine numerical health, flammability, and reactivity ratings (0 is low, 4 is high), and acute and chronic target organ effects. The algorithm covers both pure reagent chemicals and mixtures. Labels meet the requirements of the OSHA Hazard Communication standard. Each label shows the Chemical Abstracts Service registry number (except for mixtures), identity of the container contents, date of latest MSDS revision, numerical ratings for health, flammability, and reactivity, and target organ effects. Self-adhesive laser labels, preprinted with the HMIS–type color scheme, are printed on local printers. Label databases are updated quarterly, and include a supplemental database containing custom labels.

006. **LIMITED SHELF-LIFE CHEMICALS PROACTIVE PROGRAM.** J. D. Frazier, D. J. Bell and B. H. Lane, IBM Research Division, Almaden Research Center, 650 Harry Road, San Jose, California 95120-6099.

To assure safe laboratory conditions, a limited shelf life materials (LSLM) program was developed and implemented at our site in 1989. The LSLM criteria are based on peroxide formation, corrosion, hazardous gas formation, or explosion hazards associated with the storage of a chemical. Categories included in this program are: explosives (wetted with water), metal amides, liquid ethers with 1-2 alpha hydrogens or with 3-6 alpha hydrogens, corrosive gases, alkali metals, olefins with allylic hydrogens, organometallics, and chloroformates.

The owner of the chemical is reminded by an automated program when it is time to test, vent, or examine the integrity of the chemical; based on the results, the container's shelf-life can be extended. We have had no incidents involving materials that are in the limited shelf-life program; and we have been able to extend the shelf-life of many containers instead of disposing of them simply because they exceeded a defined shelf-life.

007. RESEARCH SAFETY DAY: RECOGNIZING SAFETY ACCOMPLISHMENTS OF LABORATORY EMPLOYEES. Kenneth P. Fivizzani, Nalco Chemical Company, One Nalco Center, Naperville, Illinois 60563

Research Safety Day was established to thank staff members for outstanding safety performance and to acknowledge service of individual employees on safety committees and emergency response teams. The major activity on this day is a general meeting of the entire research staff. At our first Research Safety Day in 1994, the methods of tracking and recording accidents were explained to the researchers; some were unfamiliar with the concepts of lost-time accidents and OSHA recordable injuries. Then our safety performance record was presented and compared with benchmark data from other companies. Finally, safety committee and emergency team members were identified and thanked. For 1995, a noted safety professional was brought in to speak with the researchers regarding chemical safety at home. This same consultant also conducted a training session for the research managers later in the same day.

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