U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH
CINCINNATI, OHIO 45202

HEALTH HAZARD EVALUATION DETERMINATION
REPORT NO. 73-76
TRIPLER ARMY MEDICAL CENTER
HONOLULU, HAWAII

OCTOBER 1973

I. TOXICITY DETERMINATION

Section 20(a)(6) of the Occupational Safety and Health Act of 1970, 29 U.S.C. 669(a)(6), authorizes the Secretary of Health, Education, and Welfare, following a written request by any employer or authorized representative of employees, to determine whether any substance normally found in the place of employment has potentially toxic effects in such concentrations as used or found.

The National Institute for Occupational Safety and Health (NIOSH) received such a request from a representative of an employer to evaluate the potential health hazards associated with the handling of a commercial ice machine cleaner (CSCO Ice Machine Cleaner) marketed by the Chemical Solvent Company, Birmingham, Alabama.

It has been determined through personal observation of the conditions of use of the chemical and communication with representatives of the Chemical Solvent Company pertaining to the formulation of its product that no health hazard exists with normal use of CSCO Ice Machine Cleaner .

II. DISTRIBUTION AND AVAILABILITY OF DETERMINATION REPORT

Copies of this report will be available upon request from the Hazard Evaluation Services Branch, NIOSH, U.S. Post Office Building, Room 508, 5th & Walnut Streets, Cincinnati, Ohio 45202. Copies of this determination report have been sent to:

(a) Appropriate Administrative Office, Tripler Army Medical Center, Honolulu, Hawaii.
(b) U.S. Department of Labor, Region IX.

For purposes of informing the approximately 4 exposed employees, the employer will promptly "post" the report in a prominent place(s) near where affected employees work for a period of 30 calendar days.

III. PLANT PROCESS - CONDITIONS OF USE

Approximately 35 ice-making machines are located within the confines of the Tripler Army Medical Center. Several new machines were recently purchased and the vendor recommended an ice machine cleaner manufactured by the Chemical Solvent Company (CSCO Ice Machine Cleaner).

The ice machines will be cleaned quarterly over a period of about 3 - 4 weeks. Total cleaning time for each machine is approximately 30 minutes, and 3 - 4 food handlers or ward helpers will be

assigned the responsibility for cleaning the ice machines.

The Environmental Health Officer of the hospital became concerned when laboratory tests of the cleaning solution indicated that the pH was 1.2, indicating an acid. CSCO comes in a granular form which is mixed with water to form the cleaning solution.

IV. HEALTH HAZARD EVALUATION

A. Study Protocol

From observing how CSCO Ice Machine Cleaner will be used and knowing that acids can be handled safely with certain precautions, it was decided that the best way to identify the presence of a health hazard was to find out from the manufacturer the exact ingredients of its product and to make sure that no highly toxic compounds were part of the formula.

B. Evaluation Results

Inquiries made to the Chemical Solvent Company resulted in the development of the necessary information to make a "toxicity determination." The important ingredients of CSCO Ice Machine Cleaner are Sulfamic Acid (purchased in the granular form from the E.I. Du Pont De Nemours Company) and food coloring to change the appearance of the granules.

Sulfamic acid is a nonvolatile, nonhygroscopic, odorless, white crystalline solid. It forms highly ionized, strongly acidic aqueous solutions. The pH of a 1% solution is about 1.18. To humans, sulfamic acid is considered as a moderate irritant to the skin and mucous membranes. Because of its handling ease and low corrosiveness, sulfamic acid is useful in descaling and cleaning a variety of equipment. Since sulfamic acid may be used in paper and paperboard in contact with food and food products, it has been approved by FDA under Title 21, CFR, Part 121 (which regulates the amount of migration of chemicals to food from products which may come in contact with food). It has been authorized for use as an acid cleaner in equipment used in all departments in plants operating under the USDA Poultry, Meat, and Egg Products Inspection Programs. Nevertheless, safety precautions are necessary when handling sulfamic acid, and a data sheet with handling procedures is provided by the Du Pont Company.

C. Toxicity Determination

Based upon the available data on sulfamic acid and the conditions of its use at the Tripler Army Medical Center, it has been determined that no health hazard exists with normal use of CSCO Ice Machine Cleaner.

The basis for this "toxicity determination" rests on the fact that the product can be safely handled with adequate precautions and that it

is being used on a very irregular basis at the hospital. However, it is necessary to make all persons aware of the hazards of careless use of sulfamic acid, and some recommendations are included in section V of this report.

V. RECOMMENDATIONS

The data sheet provided by the Du Pont Company lists several precautions for personal safety when using sulfamic acid. Along with NIOSH recommendations, these will be listed below.

Du Pont recommends:

1. Sulfamic acid should not come in contact with the eyes.
2. Cup-type, rubber, or soft plastic framed goggles, equipped with approved impact-resistant glass or plastic lenses should be worn when handling sulfamic acid.
3. Goggles should be carefully fitted to insure maximum protection and comfort.
4. In cases of contact, flush the eyes with plenty of water for 15 minutes and see a physician.
5. Avoid contact with skin and clothing.
6. Appropriate rubber gloves should be used when handling sulfamic acid and its solutions.
7. In case of skin contact, flush with plenty of water.

NIOSH recommends:

1. Employees handling CSCO Ice Machine Cleaner should be educated to the hazards of sulfamic acid and be provided with written handling procedures.
2. Employees should be provided with appropriate protective clothing and equipment which is properly maintained.
3. Appropriate emergency eye wash showers should be provided.
4. The directions on the CSCO package should be followed and not altered with other chemicals such as chlorine bleaches.

VI. REFERENCES

1. Data sheet: Sulfamic Acid, E.I. Du Pont De Nemours & Co., (inc.).
2. NIOSH: Toxic Substances List, p 491, 1972.

VII. AUTHORSHIP

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