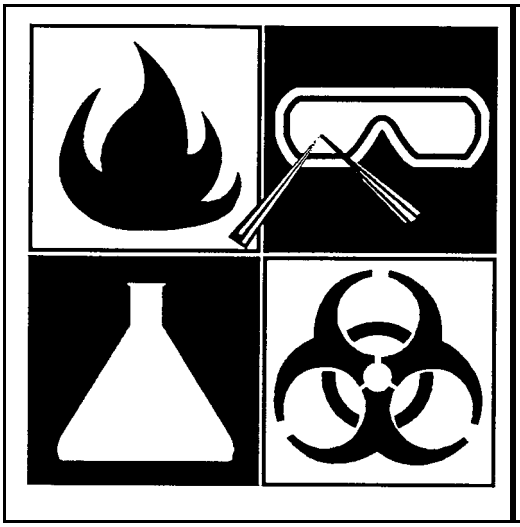


Lab Notes

April, 2000

IUPUI ENVIRONMENTAL HEALTH AND SAFETY

Allergic Contact Dermatitis - Are You at Risk?

Examples of Chemicals that Cause Occupational Allergic Contact Dermatitis

Acrylates & Methacrylates
ethyl methacrylate
methyl methacrylate
methacrylic acid
acrylic acid

Aldehydes
formaldehyde
glutaraldehyde

Metals
mercury
nickel
platinum

Photography
CD-2, CD-3, CD-4
thiourea

Miscellaneous
acetic anhydride
picric acid
epichlorohydrin
glycidyl ethers
isocyanates
limonene
turpentine
thimerisol
hexachlorophene
propylene glycol
dioxane

Skin disease is one of the fastest growing occupational diseases, already accounting for 15-20% of all reported occupational diseases according to the National Institute of Occupational Safety and Health (NIOSH). The most frequent skin disease reported is dermatitis. Most contact dermatitis usually comes from long-term exposure to a substance, but allergic reactions may occur from a single exposure and are usually more severe.

The incidence of allergic contact dermatitis (ACD) varies depending on the nature of the material handled, predisposing factors and the ability of a physician to accurately diagnose ACD using a patch test. ACD, in contrast to primary irritation, is a form of cell-mediated, antigen-antibody immune reaction. Sensitizing agents differ from primary irritants in their mechanism of action and their effect on the skin. Unless they are concomitant irritants, most sensitizers do not produce a skin reaction on the first contact. Following a sensitization phase lasting a week or longer, further contact with the same or a cross-reacting substance on the same or other parts of the body results in an acute dermatitis.

Other essential points about ACD include the following:

, As a general rule, a key difference between primary irritation and ACD is that an irritant affects many people whereas a sensitizer affects relatively few.

, Differentiation of marginal irritants from skin allergies can be difficult. Marginal irritants may require repeated or prolonged exposure before a dermatitis appears; ACD also may not develop for months or years after exposure to an agent.

Continued on page 2

Allergic Contact Dermatitis - Are You at Risk ?

Continued from page 1

, Allergic sensitization can be produced or maintained by allergens in minute amounts and in concentrations insufficient to irritate the nonallergenic skin.

, Cross-sensitivity is a common feature of the sensitized individual in which the person who is sensitized to one chemical also reacts to other closely-related chemicals.

Which of the chemicals listed in the adjacent table are likely to have a significant effect on the IUPUI campus? In the last 10 years, our campus has experienced reports of allergic reactions in the following instances:

< After using a glutaraldehyde-based cold sterilant solution for years, a staff member is no longer able to work in the position requiring the use of this material.

< Students in human gross anatomy who dissect formaldehyde-preserved specimens reacted to this activity.

< Staff who work extensively with photo developing processes had adverse reactions with chemicals used in this process.

< Repeated exposure to cleaning products containing limonene caused ACD.

In addition to the cited cases, many of the other materials on the list, such as acrylic monomers, picric acid and dioxane are frequently used on campus. Because the prognosis of occupational irritant and allergic dermatitis is poor, prevention is imperative. This fact is emphasized by one study showing that 75% of patients with occupational contact dermatitis developed chronic skin disease.

What are the primary means of controlling this hazard?

Substitution. Use chemicals that have less potential to cause ACD.

Administration. Train staff on the hazards of chemicals that can cause dermatitis and minimize the need for sensitized persons to contact these materials.

Personal Protective Equipment. Use appropriate protective equipment, such as gloves, rubber aprons and face shields, to prevent exposure to chemicals that may lead to ACD. It is particularly important to choose gloves carefully if hand contact is unavoidable.

As with most occupational hazards, the initial step in controlling exposure is recognition of the hazard in your work place setting. If you have questions about recognition or control of potential ACD-producing chemicals, please call 274-2829 for assistance.

NEW EMPLOYEE TRAINING SCHEDULE

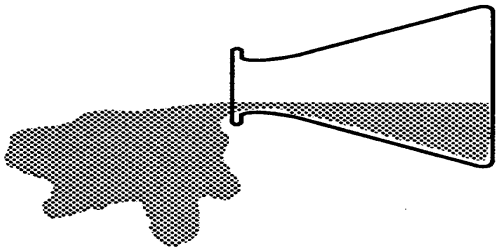
Union Building Roof Lounge - 6th Floor

Apr. 3,10,17,24; May 1,8,15,22; June 5,12,19,26-2000

9:00-10:00 AM	**Bloodborne Pathogens-**	For all employees who may be exposed to human blood, body fluids or tissue.
10:00-12:00 Noon	**General Safety-**	For all new employees.

Union Building (North) - Room 542

Chemical Lab Safety -For all employees who work with chemicals in laboratories. Sessions held the second Tuesday of every month from 9:30 - 11:30 AM.	**April 11, 2000** **May 9, 2000** **June 13, 2000** **July 11, 2000**



ACCIDENTS DO HAPPEN

by Rod Davis and John Beltz

Fire is a common serious hazard that one faces in a typical laboratory. The use of flammable materials in laboratories presents a potential fire hazard to those working with it as well as the surrounding personnel. Understanding the flammability of chemicals used in the lab and how to safely work with them is crucial in minimizing the potential for a fire.

A recent campus laboratory incident reminded us again of the dangers that flammable liquids can present. An individual working in a lab was burned when an alcohol torch was knocked over onto the table. The cap on this unit was apparently loose, causing the alcohol to spill out when the torch unit hit the table. The existing flame on the torch ignited the alcohol. Neighboring individuals in the laboratory quickly extinguished the fire with a nearby fire extinguisher and then called emergency personnel, who then transported the victim to the emergency room for treatment. Fortunately, the individual was not badly hurt. Quick thinking to extinguish the fire and an immediate trip to the emergency room helped limit the injuries suffered by this individual.

A second incident happened on campus that also involved a flammable solvent and an open flame. On Christmas Eve at 8 :00 PM, a researcher was plating bacteria in his lab. Between samples, the glass rod or loop was sterilized using alcohol and a Bunsen burner. During the sterilizing process, the alcohol was ignited and the tray where the alcohol was burning was moved to the floor. The fire was quickly extinguished by the researcher but the floor and his lab coat were burned in the process. The researcher was not seriously injured but the potential for this to be a serious event with presumably no one else in the building is evident. This incident was not immediately reported to campus police for emergency response as required. This incident could have been avoided by the use of benchtop ceramic incinerator sterilizer for glass rod and loop sterilization. These units are commercially available through scientific supply vendors.

Remember these safety tips when working with flammable materials and open flames in the lab:

- Maintain a safe distance between open flames and flammable materials (preferable on separate benches).
- Insure that equipment that contains flammable solvents are properly maintained and assembled so that they cannot leak solvents if tipped over.
- Substitute a benchtop electric sterilizer to sterilize glass rods or loops rather than using alcohol and open flames.
- Insure that all risks of ignition of the flammable material have been evaluated and eliminated.
- Activate the fire alarm and call 274-2311 for any fires caused or found, even small ones that you believe that you can put out with a fire extinguisher.

A Simple Practice Improves Fume Hood Safety

by Linda Jacobs

Airborne contaminants generated inside laboratory fume hoods during use can leak into the breathing zone of the user. A study was recently completed through the Howard Hughes Medical Institute exploring the relationship between laboratory hood work practices and containment. Twelve total hoods were studied. Hoods were evaluated during use and in a static mode. All twelve hoods were equipped with variable air volume systems and approved for use by a local health and safety institution or facilities group.

Laboratory hood containment was measured using the American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) 110 sulfur hexafluoride tracer gas test and a manikin to estimate leakage. Phenol and chloroform personal air samples were taken during a phenol:chloroform extraction procedure using a live operator.

Results indicate that phenol and chloroform were not detected in the breathing zone of the 12 operators at their selected operating sash heights of 7 to 15 inches. The tracer gas concentrations were also minimal. However, operating the hood with the sash height above the breathing zone of the manikin resulted in a higher leakage rate. They found that when the sash height is raised above breathing zone, percent leakage increased by factors of 28 to 300 times.

The data from this study shows that when providing training on proper work practices for lab fume hood use, lowering the sash should be stressed as being the major factor in reducing hood leakage.

WARNING! CHEMICAL ADVISORY

by Linda Jacobs

The Environmental Protection Agency and the Occupational Safety and Health Administration are issuing a chemical advisory on the heated liquid form of 2,4-Dichlorophenol (2,4-DCP). Skin exposure to even small amounts of the heated liquid can cause rapid death to workers. At room temperature, the solid is used as a feedstock to make herbicides and other chemical products.

EPA received a report of a worker death associated with exposure to the liquid form of the chemical in October 1998. Investigations show that a similar worker fatality had occurred in 1992 at a facility outside the United States. All cases have involved workers getting their skin splashed with the molten form of 2,4-DCP, followed quickly by collapse and death.

The advisory is being sent to past and current users of the chemical, selected trade associations, labor unions, professional associations, government agencies, and international contacts. For additional inquires or to obtain a copy of the chemical advisory, contact Joe Carra, Deputy Office Director for the Office of Pollution Prevention and Toxics at 202-260-1815 or at carra.joe@epa.gov.

Adapted from the University of Maine, Campus Safety News.

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