

# Lab Notes

August 2004

UPUI ENVIRONMENTAL HEALTH AND SAFETY

## 5 Simple Rules for Laboratory Safety

By Lee Stone

### 1. Know Your Chemicals

The best way to find out about the properties of the chemicals you are using is to read the Material Safety Data Sheet (MSDS). The MSDS sheets contain a wealth of information including health hazards, flammability hazards, what personal protective equipment you need to wear, and information on accidental exposure. Be sure you know how your chemical will react when you mix it with another chemical or begin your experimental procedure. You should have an MSDS sheet for every chemical in your laboratory.

### 2. Remain Alert To Your Surroundings

This year we experienced a significant fire in a laboratory because of failure to remain alert to the surroundings. Someone was boxing flammable waste material for waste pick up near an ignition source and a bottle was accidentally broken. The chemical then ran underneath a drying oven (ignition source) and ignited. Please remain alert to the environment around you as well as others working in your area.

### 3. Use All Necessary PPEs

Personal protective equipment is there for your own personal safety. Please wear appropriate protective equipment when needed. Refer to MSDS sheets as well as to signage outside the laboratory. If you enter a class 3 eye protection laboratory you must wear eye protection at ALL times. If you enter a class 2 eye protection laboratory you must wear eye protection

when a hazard is present. This means even if it is someone else using a hazardous or corrosive material near you. Failure to wear appropriate eye protection is an all too common violation that must be addressed.

### 4. Know The Location of All Your Emergency Safety Devices

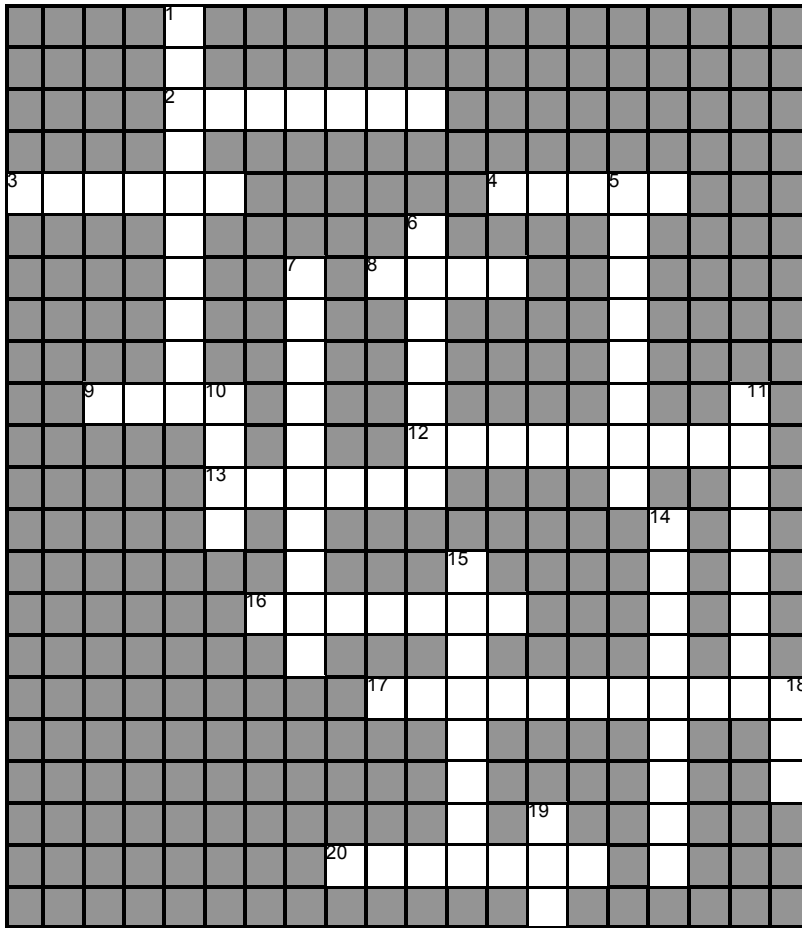
Emergency showers and eyewash stations are there to minimize damage to your skin and eyes if you are exposed to a corrosive or hazardous chemical. Make sure you know the location of these devices. You should have an emergency eyewash and/or shower within 10 seconds walking distance of the location where you are working with corrosive chemicals. In the event of a splash accident, eyes should be rinsed at the scene of the accident for at least 15 minutes.

Please do not block these safety devices with any materials. You must have unrestricted access to these devices if needed.

### 5. Know The Location of your Emergency Contact Information

Everyone should know where to find the Emergency Procedures Handbook. This handbook must be posted somewhere visible in the lab so anyone can find it quickly. It contains all emergency phone numbers and information on how to handle most emergencies.

# IUPUI ENVIRONMENTAL HEALTH AND SAFETY AUGUST 2004



Across

2. If you have more than ten \_\_\_\_\_ of flammables in your laboratory you must store them in a flammable cabinet.
3. Waste containers and dump jugs must be \_\_\_\_\_ when waste is not being added.
4. This laboratory eye classification means eye protection must be worn at all times.
8. You should always \_\_\_\_\_ your hands when leaving the laboratory.
9. Abbreviation for data sheets where you find information about chemicals.
12. An \_\_\_\_\_ procedures handbook must be posted in all labs.
13. This type of container must be used for disposal of needles.
16. All compressed gas cylinders must be \_\_\_\_\_.
17. Type of electrical outlet that should be used within 5 feet of water.
20. All secondary lab containers must be \_\_\_\_\_.

Down

1. Acids, bases, oxidizers and solvents should be \_\_\_\_\_ when stored.
5. Minimum clearance allowed (in inches) between ceiling and stored materials in a sprinkler-equipped laboratory.

Down Continued

6. For proper operation of a fume hood the face or back \_\_\_\_\_ must not be blocked.
7. If you must refrigerate these they must be in an explosion or fire safe refrigerator.
10. This must be at or below the certification line when using a fume hood.
11. It is recommended that chemicals must not be stored above \_\_\_\_\_.
14. An open flame should not be used in a \_\_\_\_\_ cabinet.
15. Ethyl ether containers must be dated when received and opened and discarded when expired because it is a \_\_\_\_\_ former.
18. This laboratory eye classification means you must wear eye protection when hazards are present.
19. Maximum allowable distance away from safety shower (in seconds) when working with corrosives.

## NEW EMPLOYEE TRAINING SCHEDULE

### Union Building Roof Lounge - 6th Floor

General Safety-For all new employees. 10:00- 12:00 Noon	August 3, 10, 17, 24, 31, 2004 September 7, 14, 21, 28, 2004 October 5, 12, 19, 26, 2004 November 9, 16, 30, 2004
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### Union Building Roof Lounge - 6th Floor

Bloodborne Pathogens-For all employees who may be exposed to human blood, body fluids or tissue. Session held the 2nd & 4th Monday of every month from 8:30 - 9:30 A.M.	August 9 & 23, 2004 September 13 & 27, 2004 October 11 & 25, 2004 November 8 & 22, 2004
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Biosafety Training-All employees who work with biohazardous materials are encouraged to attend. Session held the 4th Monday of every month from 9:30 - 10:30 A.M.	August 23, 2004 September 27, 2004 October 25, 2004 November 22, 2004
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Chemical Lab Safety- For all employees who work with chemicals in laboratories. Sessions held the second Monday of every month from 9:30 - 11:30 A.M.	August 9, 2004 September 13, 2004 October 11, 2004 November 8, 2004
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## Anesthetic Gases

Anesthetic gases are used in laboratories throughout campus during animal surgical procedures. Inhaled anesthetics include two classes of chemicals: nitrous oxide and halogenated agents. Halogenated anesthetic gases include halothane, isoflurane, sevoflurane, desflurane, enflurane, and methoxyflurane (used infrequently). The hazard comes into play when the waste anesthetic gases (WAGs) are inhaled by laboratory personnel. Presently, OSHA has no regulations regarding WAGs. The National Institute for Occupational Safety and Health (NIOSH) and the American Conference of Governmental Industrial Hygienists (ACGIH) both have recommended limits for exposure to WAGs.

Halogenated agents have been linked to reproductive problems in women and developmental defects in their offspring. Studies have documented increased rates of spontaneous abortion among female operating room personnel and wives of exposed males. Also, some studies have shown decreased abilities to perform complex tasks and decrements in performance. Only limited studies have been conducted regarding halogenated anesthetic agents.

EHS has been conducting studies for those laboratories using halogenated anesthetic agents. It is important to keep any exposure to WAGs at the lowest level possible. The following guidelines should be followed to keep employee exposure to a minimum:

1. All personnel using anesthetic gas machines should receive training on how to operate the machine properly.
2. Work practices can also lower levels and include the following: ensure all connections are tight, make sure scavenge lines are properly connected, do not turn on the gas until the mask is on the animal or intubation tube is connected, turn the gas off when not in use, and maintain the oxygen flow until the scavenge system is flushed.
3. Have the machine serviced and leak tested per the manufacturer guidelines.
4. Check the machine before use for worn parts, cracks, holes, or tears.

More information regarding anesthetic gases can be found on NIOSH's website at <http://www.cdc.gov/niosh/> and OSHA's website at <http://www.osha.gov>. Please contact Michelle Whited at 274-2068 or [mawhited@iupui.edu](mailto:mawhited@iupui.edu) if you would like your area evaluated or if you have any questions regarding anesthetic gases.

## Laboratory Accident Case Study

*Reprint of a Laboratory Safety Incident published by the American Industrial Hygiene Association.*

A laboratory worker was pouring chloroform through a gel column inside a fume hood. Due to incorrect equipment configuration, pressure built up in the column and caused the glassware at the top of the column to break, spraying corrosive material out of the hood, onto the worker's face, eyes and clothing.

The laboratory worker was wearing safety glasses, rather than chemical splash goggles. The chloroform seeped through the opening at the top of the glasses and burned both eyes. The lens of the safety glasses were partially dissolved by the chloroform. The worker did use a safety shower immediately, but was too embarrassed to remove his sweater in the presence of other laboratory workers. As a result, he suffered from second degree burns on both arms where the chemicals soaked through the sweater.

After this accident the laboratory changed the set-up of the apparatus to allow the hood of the sash to be lowered when the chloroform is being poured, providing an additional shield between the worker and the chemical and lowering the potential spray below eye level.

Lessons that were learned from this accident are:

- Keep hazardous materials that have the potential for splash below eye level.
- Use care when working with pressure or vacuum to avoid pressurizing containers.
- Wear a closed lab coat, chemical splash goggles and, if necessary, a face shield when there is a possibility of a significant chemical splash.
- Remove contaminated clothing while rinsing.
- Keep the hood sash lowered and/or use shielding when working with pressurized containers.

The above accident illustrates the importance of using the appropriate personal protective equipment as well as the importance of proper usage of your emergency safety equipment.

Know the location and proper operation of your safety showers and eye wash stations...It could save your eyesight and possibly your life.

## Formaldehyde Use on Campus

By Michelle Whited

Formaldehyde is a colorless, pungent-smelling gas that can cause watery eyes, burning sensations in the eyes and throat, nausea, and difficulty in breathing in some humans exposed at elevated levels (above 0.1 parts per million). High concentrations may trigger attacks in people with asthma. There is evidence that some people can develop sensitivity to formaldehyde. It has also been shown to cause cancer in animals and may cause cancer in humans. Health effects include eye, nose, and throat irritation; wheezing and coughing; fatigue; skin rash; severe allergic reactions. Formaldehyde is presently used in laboratories throughout campus. It can be used as a preservative, an embalming fluid, and as a sterilizer.

EHS is currently conducting an evaluation of formaldehyde use on campus, based on a list of areas that use formaldehyde. We are going to be inspecting the areas we have identified as using formaldehyde and interviewing personnel from these areas. If warranted, we will also collect air samples. If you are not sure that we have your area on our list, please call Michelle Whited at 274-2068 or email her at [mawhited@iupui.edu](mailto:mawhited@iupui.edu).

### Annual Safety Shower and Fume Hood Testing

Testing has been completed for all Fume Hoods and Safety Showers on campus. If you notice that your safety shower or fume hood has not been inspected in 2004 please call our office at 278-6150 and we will make arrangements to inspect it.

### Please Post or Circulate

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