Lab Notes

May 2004

IUPUI ENVIRONMENTAL HEALTH AND SAFETY

Controlled Substances: Record keeping, Storage and Disposal

by Kevin Mouser

Controlled substances are those pharmaceutical or chemical products which present reasonable risk for substance abuse. The products are regulated under the Controlled Substance Act of 1913. Current regulations for the dispensing, handling and disposal of controlled substances can be found in Title 21 of the Code of Federal Regulations, within Indiana Codes 35-48, and Indiana Administrative Code 846. Controlled substances are categorized according to their potential for addiction and abuse.

Researchers or practitioners are required to register with the Indiana Board of Pharmacy and with the DEA in order to purchase or otherwise possess regulated substances. Pending review of their registration, the practitioner or researcher is issued a state and federal registrant number. Barbituates, including barbitals, are one of the more commonly encountered controlled substances found on the IUPUI campus. Containers of controlled substances can frequently be readily identified by the prominent CI through CV found on the label. (However, older containers of controlled substances may not have this identification marking on the label).

Unfortunately, there have been documented cases of overdoses, including at least one fatality, resulting when controlled substances were removed or stolen from unsecured laboratory locations or waste chemical storage areas within university settings.

Both state and federal regulations detail specific record keeping, storage and disposal requirements. These requirements apply throughout the IUPUI system and include:

Record keeping

The DEA requires that registrants maintain detailed records which document the entire life of the controlled substance. Registrants are required to develop a detailed dispensement record system. Registrants are required to log each dispensement into this record. Each entry is to include the date, time and the exact quantity of material dispensed. The entry is to include who removed the material and the intended purpose. Any unused material returned to the container must also be documented.

Storage

State and federal regulations require that controlled substances be stored in a prescribed manner to guard against theft or diversion. Both regulations outline specific security requirements for both practitioners and researchers. Please contact EHS at 4-4351 for additional guidance in this area. In general, controlled substances must be stored in a secured manner and should never be stored in general access with other general chemical reagents.

Disposal

Registrants are solely responsible for the proper disposal of unneeded material obtained under their registration number. Current disposal options can be summarized as:

- Registrants may rinse residual, non recoverable amounts of material from "empty" containers. Rinsate should be discharged to the sanitary sewer. The rinsing process is to be witnessed by two additional parties. These witnesses should be recorded in the final dispensement entry.

- State and federal regulations prescribe disposal methods for greater than residual amounts. Private disposal companies working on behalf of the DEA coordinate the destruction of larger volumes of controlled substances. The DEA may approve in-house destruction under certain circumstances. However, under most circumstances waste controlled substances are to be directed to a DEA-approved disposal vendor for proper disposition. Currently, there is such a company located just north of the Indianapolis area. The process of referring these wastes to this vendor is quick and convenient. Waste controlled substances must be inventoried on a specific DEA form depending on which schedule the material is found. Copies of these forms may be obtained from EHS at 4-4351.

- EHS can coordinate the disposal of controlled substances provided that the lab generating the material can verify that the original DEA regristrant who initially acquired the material is no longer formally associated with the University.

What does LD_{50} mean on my MSDS sheet?

Acute toxicity, or the adverse effects from a single dose or exposure to a substance, is quantified by the LD_{50}. The LD_{50} is the single dose of the compound expected to kill 50 percent of a group of test animals and is usually expressed as milligrams of substance per kilogram of animal body weight. These values correspond to a relative toxicity scale running from "extremely toxic" to "relatively harmless" (see table). For example, the LD_{50} in the rat for sodium azide, a chemical frequently used as a preservative of laboratory reagents, is 27 mg/kg, earning sodium azide a "highly toxic" rating. Please note that the LD_{50} value is only an estimate of the relative toxicity of a substance. It should not be used as an absolute level of intake considered safe or unsafe for human beings.

Relative Toxicity Levels

Toxicity Level	LD_{50}-Rat	Probable Lethal Dose for Humans
Extremely toxic	1 mg/kg or less	Less than 1 gram
Highly toxic	1 to 50 mg/kg	Several grams
Moderately toxic	50 to 500 mg/kg	1 ounce
Slightly toxic	500 to 5000 mg/kg	1/2 pound
Practically non-toxic	5000 to 15,000 mg/kg	1 pound
Relatively harmless	15,000 mg/kg and up	1 quart

Source: J.T. Dufour et al., Hazard Communication Handbook, revised ed., Sacramento, Calif., California Chamber of Commerce, 1990, page 90.

Controlled Substances Contact Information

Please contact EHS at 4-4351 if you have any questions about the proper handling storage or disposal of controlled substances. EHS can provide copies of pertinent regulations, schedules and disposal forms. For specific interpretations of state code, call the Indiana Board of Pharmacy at 234-2067. For questions concerning the federal regulations or for additional disposal assistance, call the Drug Enforcement Administration at 226-7992.

NEW EMPLOYEE TRAINING SCHEDULE

Union Building Roof Lounge - 6th Floor

General Safety-For all new employees. 10:00- 12:00 Noon	May 4, 11, 18, 25, 2004 June 1, 8, 15, 22, 29 2004 July 6, 13, 20, 27, 2004 August 3, 10, 17, 24, 2004

Union Building (North) - Room 542

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.	May 10 & 24, 2004 June 14 & 28, 2004 July 12 & 26, 2004 August 9 & 23, 2004
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 .M.	May 24, 2004 June 28, 2004 July 26, 2004 August 23, 2004
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.	May 10, 2004 June 14, 2004 July 12, 2004 August 9, 2004

Refrigerated Storage of Flammable Materials

By K. Lee Stone

As we continue our annual laboratory safety inspections I have found a very common but extremely serious violation that needs to be addressed. The issue is the storage of flammable materials in a non explosion-safe refrigerator or freezer. Flammable solutions that are stored in a non explosion-safe refrigerator can very easily release enough vapor to reach the lower explosion limit (LEL). Let's use P-Xylene for example. The MSDS for P-Xylene indicates a LEL of 1.1%. This means that when the air inside the refrigerator/ freezer reaches a concentration of 1.1% P-Xylene you will have an explosion if a spark or ignition source is present. This picture is of a non-explosion safe freezer that had been used to store flammables. It exploded when the compressor was switched on. Luckily no one was present in the laboratory at the time of explosion. Please remember, if you have flammables that require refrigeration you must refrigerate these items in an approved explosion safe refrigerator or freezer.

Fire Extinguishers-Helpful Information

By David Jatczak, Fire Protection Engineer

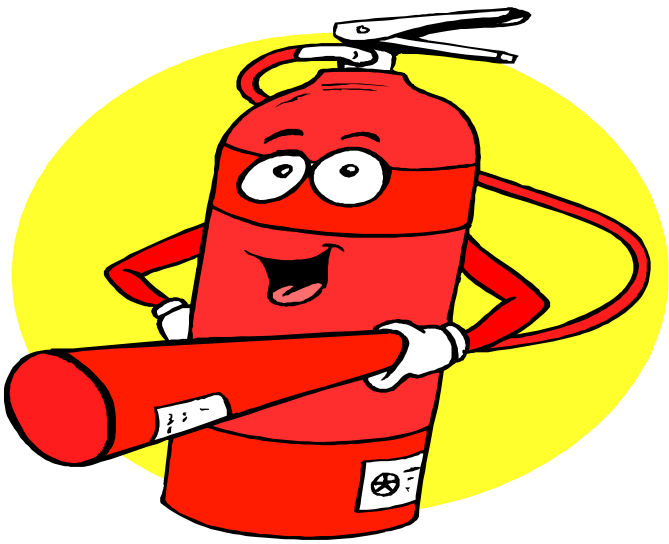
All laboratories have fire extinguishers installed to comply with state fire codes. A portable fire extinguisher should be accessible within 30 feet of your work area if you use or store flammable and combustible liquids. They should be installed in plain view, in an accessible spot, near room exits that provide an escape route.

Extinguishers cannot be obstructed by equipment or storage. They must be visible in an emergency and easy to access. They must remain in their original location to comply with fire code unless they are moved to an approved location as determined by the fire department.

Portable fire extinguishers are inspected monthly and serviced annually by an approved contractor.

A fire extinguisher should only be used to attempt to extinguish a small fire. It should be used by a person who knows how to operate it and only after the fire department has been called.

A portable fire extinguisher is a safety tool and if properly placed, maintained and used, can save lives in a fire.



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Word Search

ACID	AIRFLOW	BASE
BIOHAZARD	CARCINOGEN	CHEMICAL
EYEWASH	FLAMMABLE	FUMEHOOD
GOGGLES	LABEL	MUTAGEN
SOLVENT	TERATOGEN	TOXIN
WASTE	EMERGENCYSHOWER	

D L S Y C N E G R E M E S O L M L F R R
G E M E R G E B E A H C A R C I N T O L
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N O G W A E T E U N G O T W A S C A O G
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Precaution is better than cure. ~Edward Coke