THE UNIVERSITY OF OKLAHOMA
ENVIRONMENTAL HEALTH AND SAFETY OFFICE

SAF• T• GRAM

"A gram of safety is worth a pound of cure!"

Volume 11, Number 2 Summer 2004

In this issue...

EHSO Training News

On-line safety training has been expanded to the Norman Campus! Starting this year, employee performance evaluations included a determination as to whether the employee has completed all required safety training courses. This effort has now been made easier for Norman and Norman-based OU-Tulsa employees who have a 4x4 username and password. Go to https://www.ouhsc.edu/ehso/training-norman/new_logon.asp to log on!

The DOT Shipping and Receiving Biological Materials Self Study Training Course is now available! After a lot of hard work and rigorous research, the self study for DOT Shipping and Receiving Biological Materials training is ready for distribution. This training, required for employees who ship or receive hazardous and/or biological materials including human blood/tissue samples, infectious agents, dry ice, and formaldehyde/formalin, must be completed every two years. You can access the manual and quiz at http://w3.ouhsc.edu/ehso/. Be sure that to complete the quiz and return it to your campus EHSO to receive a certificate of completion (see the next article to see why). An on-line module will be available soon!

If you have any questions regarding our new training available, feel free to contact our office.

FAA Inspectors Look for DOT Compliance at OU

On at least two recent occasions, FAA inspectors have visited OU looking for proof of compliance with Department of Transportation (DOT) and International Air Transport Association (IATA) regulations on shipping and receiving infectious and hazardous materials. Some issues to be aware of:

- **Documented training** is required for employees who ship or receive hazardous and/or biological materials including human blood/tissue samples, infectious agents, dry ice, and formaldehyde/formalin. This training must be completed every two years. This training is currently available through a self study (read the manual, complete and turn in a quiz) found at http://w3.ouhsc.edu/ehso/. An on-line version is being developed as well.
- **A copy of the training certificate** received after completion of the training should be kept in a safe place and made available to Federal or State inspectors upon request.
- **A copy of the completed and signed shipping paper should be retained for at least 375 days after the shipment has been accepted by the carrier**, and the shipper must make this document available to Federal or State inspectors upon request. (This is a new requirement!)

- **The 24-hour emergency response number placed on the shipping paper by the shipper MUST be able to be answered by a person knowledgeable of the shipment** during the entire time of the shipment period, and should not be the recipient. For OUHSC Oklahoma City personnel, this number can be 1-405-271-4911 which is the Campus Police and Public Safety number HOWEVER, you must contact them in advance and tell the dispatcher who you are, what you are shipping, that you have put the Campus Police phone number on the package, and how to reach you at any time during the shipment period should something occur. For all other locations, the shipper should put a number at which they can be reached at all times during the shipment.

Cell Phone Recycling Bill Passes

Source: http://www.cawrecycles.org/Press%20Room/General%20Releases/Pavley%202901%20052704%20Release.htm

A bill requiring cell phone retailers to take back obsolete cell phones at no cost to the consumer and to provide for their recycling, passed the Assembly Natural Resources Committee and the Assembly Environmental Safety and Toxics Committee in last month in California.

Almost 45,000 cell phones are estimated to be thrown away every day in California (no telling how many nation-wide). Their circuit boards contain hazardous materials including arsenic, lead and mercury, many of which have the potential to be released into the air and groundwater when burned in incinerators or disposed of in landfills. The California legislation requires retailers of cell phones to provide consumers with a cost-free and convenient system for the reuse and/or recycling of cell phones and ensure that they do not end up in the waste stream.

A few voluntary cell phone donation/recycling sites have been established in Oklahoma. Visit http://www.charitablerecycling.com/CR/oklahoma.asp for more information.

Mercury In the News

Source: http://www.epa.gov/region09/cross_pr/childhealth/mercury-nevada04.htm
http://www.courierjournal.com/localnews/2003/12/17ky/met-front-mercury12170-5102.html

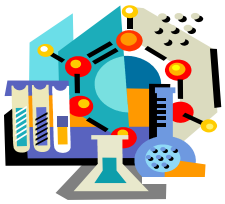
Middle School Contaminated - In January 2004, residents in northern Nevada found out first hand how dangerous mercury can be when dozens of middle school children in Gardnerville were exposed to the element and the vapors it gives off. Less than a week later, severe poisoning from long-term exposure to mercury vapor sent a Las Vegas 17-year-old youth to a hospital's intensive care unit for a week, and the exposure may cause lifelong effects.

The quarter cup of mercury brought to the school by a student contaminated not only classrooms and a school bus, but the clothing and belongings of more than 50 of his classmates. The state and federal governments spent more than $100,000 on decontamination efforts and the school was closed for more than a week.

Youth Contaminates Home - In Las Vegas, EPA and Clark County officials spent weeks decontaminating a home in which a another youth lived because of extremely high levels of mercury vapor. The youth had spent months playing with as much as a quart of mercury, spreading it throughout his house and backyard. A substantial amount of his family's personal property had to be destroyed because contamination levels were so high, and the family's dog experienced extreme mercury poisoning.

Laboratory Mercury Spill Leads to Teacher's Arrest - A former biology teacher at Sacred Heart Academy of Kentucy was arrested last December, about six weeks after she allegedly spilled a small amount of highly toxic mercury in a school laboratory and tried to clean it up without alerting school officials. The teacher was charged with first-degree criminal mischief (a felony) for allegedly causing more than $64,000 worth of damage to the lab and for waiting a day after the spill to notify school officials.

When mercury is spilled in a classroom, the students were supposed to be evacuated and the room sealed off. Police said the teacher attempted to take care of the spill by washing items touched by the toxic element and then disposing of the mercury into two sinks, thereby contaminating them. By the next day it had spread and bubbled up, and it was then that the teacher notified school officials. School officials and police said no students came in contact with the mercury, a silver-colored metallic chemical that, if inhaled, can cause a number of serious health problems, including kidney or liver damage. If ingested, it can cause illness or death. An on-scene coordinator for the Environmental Protection Agency, said the amount of mercury spilled was enough to cover only the bottom of a glass, but said vapors in the chemistry classroom exceeded the recommended levels of exposure.



LAB SAFETY CORNER

Glove Reminder

Gloves worn in the laboratory to protect you from chemical and biological hazards should be removed before leaving the laboratory. If gloves are not removed, how can you assure others that what you have been working with is not contaminating everything you touch, such as elevator buttons and door knobs? If you must wear gloves outside the laboratory, take off the potentially contaminated gloves and put on clean gloves. Please take into consideration that those who do not work in labs worry about whether they are being exposed to something hazardous from your potentially contaminated gloves.

Sandals in the Lab

Summer's here and with it hot weather, shorts, tank tops, and sandals. Enjoy the nice weather but please leave the sandals for your activities away from the lab. Every year there are injuries in laboratories to toes, feet and legs from spilled chemicals, broken glass, and dropped materials on unprotected skin. Keep your toes protected in the labs. If you must wear open-toed shoes to campus, keep solid shoes in the lab and change for working hours.

Tennis shoes don't provide much protection either. This spill of concentrated chromic acid onto a graduate student's fabric top tennis shoes resulted in skin exposure. Luckily, no serious burns resulted, but he did have orange toes for about six weeks.

And if keeping safe isn't enough incentive, the appendix to the OSHA lab standard states, "Wear shoes at all times in the laboratory but do not wear sandals, perforated shoes, or sneakers."

Open Flames in Lab Causes Fire

Source: http://www.stanford.edu/dept/EHS/prod/researchlab/bio/docs/Open_Flames.pdf

Many universities have taken a strong stance against the use of gas burners or alcohol flames in biological safety cabinets. Reports from the Centers for Disease Control and Prevention (CDC) suggests that open-flames are not required in the near microbe-free environment of a biological safety cabinet and create turbulence which disrupts the pattern of air supplied to the work surface jeopardizing the sterility of the work area. This is also the recommendation of the World Health Organization (WHO), as well as the major biological safety cabinet manufacturers.

This is a picture taken of a lab that used open flames while performing standard microbiological procedures that resulted in tragic destruction.

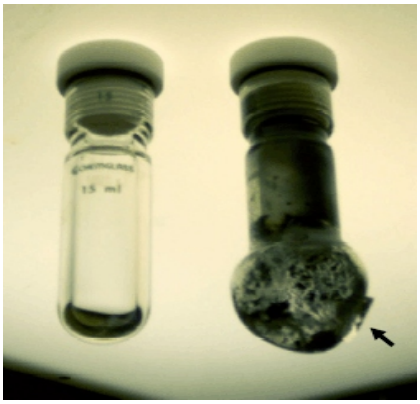
A safer solution is to remove Bunsen burners or replace them with alternative technology such as electric incinerators. You may also want to use disposable loops, spreaders, and other such instruments. Autoclaving instruments such as tweezers, scissors and scalpels is another alternative along with using alcohol to sterilize any glass materials being used (allow to evaporate before opening or dry with a Kimwipe). If it is deemed absolutely necessary for the work being done, it is recommended to use a pilotless burner or touch-plate microburner to provide a flame on demand.

Microwave Chemistry Hazards

Source: http://www.chem.purdue.edu/chemsafety/NewsAndStories/microwavechemfinal.pdf

Microwave-assisted reactions have become popular methods in chemical and materials synthesis. In a research-grade instrument, the heating is rapid and even, with considerable reductions in reaction times and unwanted side products.

Substituting research-grade microwave ovens with low-cost standard household microwave appliances can achieve many of the same results. However, there are at least two safety issues regarding their application toward chemical synthesis.



First, there maybe electrical hazards associated with such instruments if flammable organic solvents are released from the reaction. This might be circumvented by using heavy-walled glass vessels equipped with O-ring seals, which have been designed to withstand high temperatures and pressures. The second concern is the extremely high temperature which can be achieved by microwave-assisted heating, if left unchecked. These temperatures are reported to be sufficient to melt glass, as illustrated by an example provided by Purdue University's Chemistry Department.

A heavy-walled glass reaction vessel containing cobalt carbonyl acetonitrile was tightly sealed, set upright in a Pyrex glass beaker inside the microwave, then heated at full power (assumed to be 600W) for 5 minutes. Upon opening the microwave, the bottom part of the vessel was found fused to the supporting Pyrex beaker, and swollen to twice its original diameter (see photo). A discussion with a glassblower lead Purdue to believe that the microwave reaction exceeded temperatures of 800 ˚C, softening the thick glass wall. Fortunately there was no explosion, because the O-ring had cracked open enabling the pressurized contents to be vented.

Take extreme caution if you choose to use standard household microwaves for chemical reactions.

Picric Acid Explosion

On Friday, March 26, 2004, the Oklahoma Highway Patrol (OHP) Bomb Squad was dispatched to the OUHSC Research Building after a 1 quart bottle of dry, crystallized picric acid was discovered in the basement during a moving process. OHP bomb technicians suited up in full bomb resistant gear before entering the building to remove the picric acid. After successful removal from the building, the picric acid was taken to the Edmond Police Department firing range where it was destroyed. The incendiary device used to detonate the picric acid was only a one-gallon container of gasoline, so one can see from the photograph below how dangerous this material can be.

The *OUHSC/OU-Tulsa Laboratory Safety Manual* contains procedures on how to properly handle picric acid. Some of the procedures include:

- Keep the water content of any container of picric acid above 10%.
- Salt formation is enhanced through contact with metals, concrete, ammonia and bases. Avoid contact with these materials.
- Age or improper storage may cause small crystals to develop around the cap of the container. Explosions can occur when the cap is removed. If this possibility exists, do not attempt to open the container and contact the EHSO immediately.

Surplus Chemicals

In an effort to reduce waste at the University (saving $$$ and other resources), the EHSO has established a surplus chemical program. These chemicals are in good shape, mostly unopened, and available free of charge to University

OUHSC Campus
(Contact Chad Winn at 271-3000)

Ammonium Carbonate	Methylene Chloride	Drierite
Ammonium Sulfide	Molecular Sieves	Aquasol-2
Barium Sulfate	Fluorescein	Ethyl Acetate
Bezoic Acid	Potassium Cyanide	Silica Gel
Formaldehyde Solution	Petroleum Ether	Pump Oil
Hydrochloric Acid	Scintiverse BD	1-Pentanol
Isopentyl Alcohol	Sodium Cyanide	1-Propanol
2-Mercaptoethanol	Sulfuric Acid	n-Butylamine

Norman Campus
(Contact Trent Brown at 325-5147)

Ethyl Acetate	Sodium Bicarbonate
Toluene	Antimony Potassium Tartrate
Acetophenone	Phenylmagnesium Bromide
Acetic Acid	Bis (2-Methoxy-Ethyl) Ether
Boric Acid	Ferrous Sulfate
Tin	
Soda Lime	
Immersion Oil	

The **Saf·T·Gram** is published by the University of Oklahoma Environmental Health and Safety Office

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