
The Waste-Paper

The Hazardous Waste Disposal Monthly Update

Volume 9 Issue 5

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Reminder: Before you leave...

- Go through your lab with your PI or another lab worker. Look at every chemical container and be sure they are labeled correctly.
- Determine which chemicals are needed for future projects and which are not.
- Dispose of unneeded chemicals. If there are materials for disposal after May 24th, make arrangements for someone else to get rid of them at the next pickup.

If you have a whole lab's worth of chemicals to dispose of, we may be able to arrange for help from our waste contractor. Contact EHS at 8-5294 if you have any questions.

This Month's Waste Disposal Drop Off:

Wednesday, May 24, 2006

Lewis Thomas loading dock

- collection room open from 1:00 - 4:30 PM
- Coordinators: [Michael Fredericks](#) (8-1351) or [Mary Zikos](#) (x8-4095)

Jadwin Hall room 124 (Physics only)

- Do not drop off waste before Wednesday
- Coordinator: [Joe Horvath](#) (x8-4364)

E-Quad room 7 (E-Quad and Bowen)

- collection room open from 2:00 - 3:00 PM
- Coordinators: [Joe Laskow](#) (8-4739) and [Joe Palmer](#)

Frick loading dock (Chemistry, Psychology, Vis Arts)

- collection room open from 1:00 - 2:00 PM
 - Coordinator: [Kevin Wilkes](#) (x8-3920)
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Expecting Summer Help?

Summer is fast approaching and many lab groups will be taking on summer research help – usually high school or college students and teachers. Before enticing the next generation of Nobel Laureates with all that Princeton has to offer, consider the following:

High School Students

Whether paid or unpaid, NJ child labor laws restrict the type of work that individuals under the age of 18 can perform. Children 15 and under are prohibited from conducting any type of work in most research laboratories. For those who are 16 or 17, the Principal Investigator must complete a proposal and submit it to EHS for approval. The forms and a description of the process are available on the web at

<http://web.princeton.edu/sites/ehs/hsstudents/hsstudents.htm>. Students must attend Laboratory Safety Training, as described below.

Others

Anyone working in a research laboratory (paid or unpaid) **must** attend Laboratory Safety Training offered by EHS. Similar training from other organizations is not a substitute for this requirement. Open Laboratory Safety Training sessions are offered at least once per month. The schedule is on the EHS web site at

<http://web.princeton.edu/sites/ehs/Training/calendar.htm>. Please contact Kelly States at 258-2648 or kstates@princeton.edu to enroll or to schedule additional sessions.

Household Hazardous Waste

Mercer County is sponsoring a household hazardous waste collection for items such as computers, oils, photo chemicals, pesticides, pool chemicals, paints, anti-freeze and more.

Saturday, June 17, 8:00 AM to 2:00 PM

Dempster Fire School, Bakers Basin/Lawrence Station Roads, Lawrenceville.

More information is available on the web at http://www.princeton.twp.org/household_chemical_waste.html.

<i>EHS HAZARDOUS WASTE CONTACTS</i>	
Main Office	8-5294
Steve Elwood (Chemical & Radioactive Waste)	8-6271
Marcia Leach (Waste-Paper)	8-5296
Don Robasser (Biohazardous Waste)	8-6256
EHS Web Page	http://www.princeton.edu/ehs

Time Sensitive Materials – Part 3

The last two issues of the *Waste Paper* covered peroxide-forming chemicals, such as ethers, and multi-nitro compounds, such as picric acid. There are other categories of time-sensitive chemicals that some lab workers may not have considered.

Chloroform should be treated as time-sensitive if it has not been stabilized or is stabilized with amylene. Phosgene can evolve both in the liquid and the vapor space within the container. In 1998, four students at UCLA were mildly poisoned by phosgene after using chloroform that had been stored in a brown glass bottle at room temperature for three years.

Tollens' reagent or **ammoniacal silver nitrate** is a solution containing silver nitrate, dilute sodium hydroxide and ammonium hydroxide. Over time, Tollens' reagent may become unstable and explosive due to formation of silver nitride. Tollens himself described such reactions when he first published this method for detection of aldehydes back in 1882. Three years ago, an explosion occurred in a high school in England after a student put a pipette into a storage bottle of two-day old Tollens' reagent. Several students were hospitalized after being sprayed with glass and the caustic Tollens' reagent. A similar explosion was reported by Battelle Pacific Northwest Laboratories when a laboratory worker rinsed a glass vial containing two-day old solution using a squeeze bottle of deionized water.

Tollens' reagent should be freshly prepared each time. Neutralize any excess with nitric acid or hydrochloric acid to achieve a pH of 4 to 7. Dispose of the resulting material as hazardous waste, due to the silver content.

Piranha solution is a mixture of sulfuric acid or ammonium hydroxide and hydrogen peroxide. When stored in a sealed container, the solution continues to generate heat and gas, potentially resulting in an explosion. Piranha should be freshly prepared for each application. Allow leftover material to cool completely before adding water and flushing the solution down the drain with copious amounts of water. Additional information about handling piranha is available in the Lab Safety Manual at <http://web.princeton.edu/sites/ehs/labsafetymanual/cheminfo/piranha.htm>

There have been numerous reports of over-pressurization of cylinders containing **anhydrous hydrogen fluoride** (AHF) or **anhydrous hydrogen bromide** (AHBr). The corrosive, toxic liquid is normally packaged in steel cylinders. Over time, these

chemicals will react with the iron in the steel to form hydrogen gas, increasing the pressure within the cylinder. If the cylinder has a pressure-relief device, the contents will likely be released. If no pressure relief device is present, which is the case with most lecture bottles, the over-pressurization can result in catastrophic failure of the cylinder. This has usually occurred when the cylinder had been stored for more than 15 years.



A lecture bottle of anhydrous HF ruptured at the UC-Santa Barbara. Debris shattered the heavy-duty glass of the gas cabinet before striking a wall 10 feet away.

Lecture bottles of HF or HBr should be returned to the distributor or disposed after two years.

Prolonged storage of corrosive gases can corrode pressure relief devices, causing them to fail. Several incidents of valve failure have occurred when a laboratory worker attempts to open the valve on an old cylinder of corrosive gas and the entire valve stem is ejected from the valve body.

Lessons Learned

The bottom line is that many chemicals may become unstable or may present unexpected hazards when stored for long periods of time. Read the material safety data sheet and the container label to understand how to safely store the chemicals in your lab. Avoid stockpiling chemicals. Take advantage of the monthly hazardous waste pickups. If you discover a material of questionable stability, please contact [Steve Elwood](#) at 258-6271 or [Robin Izzo](#) at 258-6259. Do not attempt to open or move the containers. Depending on the situation, we may make arrangements with our hazardous waste contractors to come directly to the lab to stabilize and dispose of the material safely.