
The Waste-Paper

“A Waste is a terrible thing to mind”

Volume 8 Issue 1

January 2005

Just Arriving?

Welcome to Princeton! If you are new to the University or are just staying for the spring, here are a few items we hope will be helpful to you. Environmental Health & Safety manages the hazardous waste program on campus. Chemical wastes are collected from Frick, E-Quad and Lewis Thomas Labs on the last Thursday of each month. However, waste should be brought down the day before according to your [department schedule](#).

Until that time, waste is managed in the lab. Here are a few requirements when generating hazardous waste:

- Waste containers must be labeled as soon as waste collection begins. EHS provides labels, which you should complete and affix to the container right away, or else you must write the words *Hazardous Waste* and the waste contents on the container.
- Wastes should always be kept closed except during filling, and funnels should not be left in waste containers in anticipation of future fillings.
- Store away from floor drains or sinks or use secondary containment in case of spillage.
- Disposal of chemical waste down the sink is prohibited. Evaporation of solvents is also considered a prohibited means of disposal.

If you would like more information about waste disposal, please visit the [Waste section](#) of the [EHS web site](#). Don't forget – everyone working in a lab MUST attend Laboratory Safety Training provided by EHS. See the [Lab Safety](#) section of the EHS web site for more information.

Leaving so soon...?

Are you forgetting something? How about that bottle of epichlorohydrin you left under the lab bench? Or that distillation apparatus in the hood with the strange, pasty yellow liquid in the round-bottom flask?

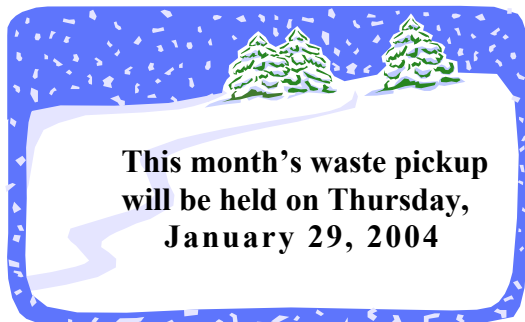
The point is that you're not completely free until you've addressed the disposition of all of your leftover chemicals, whether you entrust them to another lab worker or you dispose of them as hazardous waste. Don't just leave a chemical behind, thinking that someone else knows what it is, how old it is, what it's used for, etc.

Call EHS at 8-5294 if you have any questions.

Before you go...

- go through your lab with your PI or another lab worker. Look at every chemical container and be sure that each is unambiguously labeled with the names of the chemical constituents.
- determine which chemicals are needed for future projects and which are not
- dispose of unneeded chemicals. If there are materials for disposal after January 29th, 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 a special pickup at a time removed from the regular monthly waste pickup.



EHS HAZARDOUS WASTE CONTACTS

Main Office	8-5294
Steve Elwood (Waste Manager)	8-6271
Robin Izzo	8-6259
Joan Hutzly	8-6251
Marcia Leach (Waste-Paper)	8-5296
Sue Dupré (Radioactive Waste)	8-6252
Don Robasser (Biohazardous Waste)	8-6256
EHS Web Page	http://www.princeton.edu/ehs

Cleaning & Neutralizing Spills

This article describes cleaning and neutralizing chemical spills using a spill mix developed by Margaret-Ann Armour, Assistant Chair of the Chemistry Department of the University of Alberta. The mix may be used on several different types of chemical spills. Clean-up of flammable solvents, ammonia solutions, and mineral acids and bases are discussed below. Always wear the appropriate protective equipment, including gloves and eye protection, when cleaning up spills.

The Spill Mix

The spill mix may be prepared by mixing equal volumes of sodium carbonate, bentonite (clay cat litter) and dry sand. The sodium carbonate helps to neutralize the spill, the bentonite absorbs the liquid and eliminates fumes, and the sand moderates and smothers any reaction that might occur. Please note that the solid absorbent included in the EHS spill kits found in most science and engineering buildings contains vermiculite, not this spill mix.

Spills of Flammable Solvents

This procedure can be used for most flammable solvents, such as methanol, ethanol, acetone, diethyl ether or hexane. The spill mix rapidly eliminates evaporation, thus reducing the amount of flammable vapors that could be ignited.

1. Cover the spill with enough *spill mix* to completely absorb the liquid and provide a top layer of dry solid.
2. Using a plastic scoop, transfer the mixture into a sealed container and place it in a fume hood.
3. Package the mixture for disposal as hazardous waste. Place a yellow hazardous waste sticker on the container.

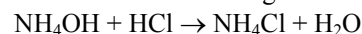
Spills of Ammonia Solutions

Ammonia vapors can be very irritating. It may be necessary to use respiratory protection when cleaning up spills of ammonia solutions. Only individuals who have been trained and fit-tested by EHS in the past year and who have received approval from EHS and McCosh Health Center to use a respirator may use respiratory protection, such as self-contained breathing apparatus or air-purifying respirators. Contact Maurice Lynch at mlynch@princeton.edu or 258-7882 for more information regarding respiratory protection.

1. Cover the spill with enough spill mix to absorb the liquid and to maintain a dry layer of spill mix on top.
2. Scoop the mixture into a sealed container and place it in a fume hood.

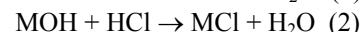
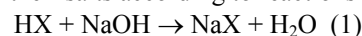
3. In the hood, slowly add the mixture to a plastic pail of cold water.
4. Check the pH and neutralize the liquid by stirring in 5% aqueous hydrochloric acid, as needed.
5. Decant the liquid into the drain. Dispose of the solid material in the regular lab trash or wash with warm water, dry and reuse as spill mix.

The addition of hydrochloric acid yields ammonium chloride, as indicated in the following reaction:



Cleaning Spills of Mineral Acids & Bases

By following the procedures outlined below, the aqueous solution is neutralized and the acids and bases are converted to their salts according to reactions 1 and 2



1. Cover the spilled material with enough *spill mix* to absorb all of the liquid.
2. Fill a plastic pail $\frac{3}{4}$ full with cold water. Add the spill mixture. Place in fume hood.
3. Test the pH of the solution. If the pH is less than 5, add solid sodium carbonate or 5% aqueous sodium hydroxide to neutralize it. If the pH is more than 9, add 5% aqueous hydrochloric acid to neutralize it. Stir the mixture thoroughly.
4. After the solids have settled, decant the neutral aqueous liquid to the drain.
5. Discard the solid residue in the regular laboratory trash or dry it and reuse it in a *spill mix*.

Quantities of spill mix required to absorb 100 ml of some mineral acids and bases, and volumes of acid or base required to neutralize the resulting aqueous solution.

Liquid "spilled"	Spill Mix	5% NaOH	5% HCl
Sulfuric acid	255 g	1.68 L	
Nitric acid	165 g	360 ml	
Phosphoric acid	220 g	700 ml	
20% Sodium hydroxide	125 g		250 ml
Glacial acetic acid	150 g	600 ml	

EHS Spill Kits

The spill kits located near elevators and in some common areas are provided by EHS and include Silver Shield and nitrile gloves, disposable aprons (with and without sleeves), shoe covers, goggles, spill pads, instructions, waste bags, waste stickers and a pail of vermiculite. Consider the need for additional materials for the specific chemicals in your lab.

If you use any items from the EHS spill kits, contact [Joan Hutzly](#) at 258-6251 to restock.

