

IV. Chemical Storage, Use, and Disposal

A. Frugal Lab Practices

Purchasing

It is always tempting to buy kilogram scale materials at 10% more cost than gram-scale materials. However, this practice often leads to unused materials (that may be slowly deteriorating) taking up space in the laboratory storage areas. Please be reasonable about the amount of material you need. Most materials can be purchased and delivered within three days, so planning ahead and ordering in a “just in time” manner will limit the amount of waste our laboratory produces and keep our work area clutter free.

Scintillation Vials

Scintillation vials, despite their size, are not cheap. Used scintillation vials can be cleaned like any other glassware and washed in the base bath for re-use. Plastic tops of scintillation vials may be disposed after use.

Gloves

Gloves can and should be reused if they are not contaminated. Just carefully remove them and place on your bench for reuse. Unless you are using highly toxic reagents (in which case you should throw out gloves after any chance of contamination), you should not have to use more than 2-3 pairs of gloves a day. Do not wash gloves with organic solvents (latex and nitrile gloves are permeable to acetone).

Rubber Septa

Rubber septa may be cleaned by soaking them in a soap solution overnight and rinsing them off with warm water.

B. Purchasing Chemicals, Supplies and Chemical Orders

Most simple chemicals and solvents are stocked by the [ChemStores in Knight Chemical Laboratory \(KNCL 111\)](#). To order a ChemStores item, fill out the “ChemStores Stockroom Order Form” and hand it off to the labmate currently charge of ChemStores orders. Keep in mind that ChemStores is often closed before 4 pm, not open on weekends, and has a tendency to run out of popular solvents on a moment’s notice.

When requesting a re-order of a certain item that is not found at Chem Stores, find its page on the Quartz Inventory page and simply press “request item.” To order a new item, search for the item at VWR, Fisher, or Sigma, login to the vendor's website with our credentials (provided in the Joy Lab Logins file in the Dropbox folder or in the Quartz Documents page). Sometimes vendor prices are lower after logging in. Copy the details for each item (Name, CAS, catalog number, price, etc.) in the “+Add Request” page under the “Order Request” tab. The lab member in charge of orders typically fills them out once per week due to shipping fees. Once the item is

received, the lab member who opened the item marks "Order Received" on the "Order Requests" Quartzzy page and you will be notified via email that your item has come in. Quartzzy will automatically update the inventory to show your new item.

C. Storing and Labeling Chemicals

Once a chemical is received, the amount and storage location of the chemical should be recorded properly in the chemical inventory database on Quartzzy. The chemical inventory should also be consulted before ordering any chemical or purchasing reagents from the ChemStores. Once a chemical bottle is emptied, the container should be disposed of properly and the chemical inventory should be updated. Do not return empty containers to the storage areas. In general, the container should be rinsed with an appropriate solvent and disposed of in a waste bottle. Once you are sure that the entire chemical has been removed, the bottle can be placed in a glass disposal bin or trash container. If new communal chemicals are ordered, make sure they are stored in the correct location. There are also 3 refrigerators (2 with a freezer) for certain chemicals and samples. Chemical locations are outlined below:

1. Solvent drums: stored in a flammables cabinet
2. Acids: Stored in the acid cabinet, away from bases
3. Bases: Stored in the base cabinet, away from acids
4. Heat Sensitive: Stored in a refrigerator of appropriate temperature
5. Moisture sensitive: stored in a desiccator

If you are unsure where a chemical needs to be stored, first check the label on the chemical. It will often say things like flammable, refrigerate or oxidizer. You can also check the MSDS of the chemical. Links to find the MSDS's can be found at <http://hazard.com/msds/> All chemicals that are placed in a container other than its original packaging should have a label with the chemical name, CAS #, the date that it was placed in the container and your initials. This includes chemicals that are synthesized in the laboratory. Chemicals that are synthesized should be labeled with the notebook and page number that contains the details of preparation.

D. Solvent Health Hazards

All organic solvents have the potential to damage bodily systems, so care should be taken to minimize exposure. Using solvents inside the fume hood helps minimize solvent vapor inhalation. The list below details specific health hazards associated with common laboratory solvents.

Skin-Penetrating Solvents

Dimethylformamide (DMF), Glycol ethers, Methanol, Toluene, Xylene

Central Nervous System Damage

Aliphatic hydrocarbons (hexanes, pentane, cyclohexene, etc.), Aromatic hydrocarbons (toluene, xylenes, etc.), Chlorinated hydrocarbons (methylene chloride, chloroform, etc.)

Carcinogens

Benzene, Chlorinated Solvents (known for lab animals, suspected for humans), Dimethylformamide (suspected), Dioxane (suspected)

Fire Hazards (Flashpoints below room temperature)

Acetone, Cyclohexane, Diethyl ether, Hexanes, Pentane, Tetrahydrofuran, Toluene

E. Disposing of Chemical Waste

Each fume hood contains a plastic beaker for halogenated and non-halogenated waste. When these beakers become filled, pour them into the appropriate 20L solvent waste container and *fill out the corresponding waste sheet*. Solid waste (silica, filter paper, sand...) is be disposed of in the plastic solid waste buckets.

Acidic and basic solutions can be disposed of by neutralizing them before pouring them down the sink.