

PolySeed®

Technical Report

The Organized Laboratory Chemical Storage

Managing chemical inventories effectively can prevent many of the problems that plague environmental laboratory managers. By maintaining an organized chemical storage system, lab managers can increase efficiency and reduce safety risks. Follow the guide below to get your chemical storage under control. Once you have your new storage system in place, keep in mind that organization is an ongoing process, not a destination. It is important to put into use the new systems you've created and make sure co-workers understand and use the new systems as well.

Step 1 – Sort by category

Strict alphabetical order is not an acceptable storage system for chemicals because it may place incompatible chemicals next to one another or may cause large-sized glass bottles to be stored on the top shelf. Instead, organize your chemicals according to compatibility. To do this you will first need to sort the chemicals by category, assign a color to each category and label each container with colored labels or tape accordingly. For example:

-  **Flammable Liquids** -- Label flammable liquids using RED tape.
-  **Combustible Solids** -- Label combustible solids using RED tape.
-  **Corrosive Acids** -- Label corrosive acids using WHITE tape.
-  **Corrosive Bases** -- Label corrosive bases using WHITE with diagonal black lines.
-  **Highly Reactives** -- Label highly reactives using ORANGE tape.
-  **Extreme Toxics/Regulated Materials** -- Label extreme toxics/regulated materials using BLUE tape.
-  **Low Hazards** -- Label low hazards using GREEN tape.

Note: *Does your laboratory maintain a Chemical Inventory Spreadsheet? If not, now is a great time to set one up. If your laboratory already has an inventory system in place, now is a great time for updates. For information on developing a new spreadsheet, see Step 5 below.*

Step 2: Create Compatibility Groupings

Compatible chemicals have similar hazards. Chemicals with similar hazards, if mixed together, produce mild or no reaction. To avoid violent reactions, incompatible chemicals with dissimilar hazards should be stored separately. Determining which chemicals can be safely stored together can be a multiple step process.

Use this Chemical Compatibility Worksheet to develop your compatibility groupings. By using this worksheet, you can determine which of your hazardous chemicals can be stored together safely in just 4 easy steps. For quick reference, here are some general guidelines to follow:

- Store acids separate from bases
- Store organic acids separate from inorganic acids (nitric acid from formic acid, acetic acid, and anhydrides)
- Store ignitables separate from oxidizers or sources of ignition, especially solvents
- Store flammable liquids separate from corrosives (except acetic acid, store with flammables)
- Store pyrophorics separate from flammables and corrosives
- Store oxidizing agents separate from reducing agents
- Store halogenated solvents separate from non-halogenated solvents
- Store water reactives separate from aqueous sources

Step 3: Identify Storage Locations

The next step in this process is to assign a specific storage site to each chemical category based on your compatibility groupings. Clearly label the newly designated areas using colored tape that corresponds with the color of the assigned categories. Here are some tips for determining your storage locations:

- Do not store chemicals in fume hoods or work areas.
- Never store flammable chemicals in a standard domestic refrigerator.
- Storing chemicals on the floor, even temporarily, should be avoided. Chemicals should not be stored above eye level so that storage circumstances can always be easily evaluated (corroded containers or deteriorating container).

- All storage area shelving should be firmly secured to the floor and wall.
- Island shelf assemblies should be avoided unless they are secured to the ceiling.
- Lips on storage shelves are recommended to prevent bottles from falling off.
- Wooden shelves are best suited for general storage since they are less effective heat conductors, but metal shelves should be used for flammables to reduce fire hazards.
- Chemical storage under, over or near a sink should be avoided since many chemicals are affected by moisture and can become highly hazardous.
- Chemical storage should be away from heavily traveled areas.
- All storage cabinets or closets should be locked when not in use.
- Stored chemicals should be cool and dry and have caps and lids tightly closed; no chemical should be on the outside of the container.
- Store highly toxic chemicals and carcinogens in well-marked, ventilated areas that are segregated from all other chemicals.
- Always read chemical labels: store all chemicals according to manufacturer recommendations.

Step 4: Put Your Plan into Action

With your color-coded chemicals and storage location plan in place, it is time to reap the rewards of your organizational efforts: Arrange all chemical containers in their assigned storage areas. This should be easy -- all red-taped containers go to the red-taped shelves and so on.

Step 5: Develop a Chemical Receiving System

With your new storage system intact, it is important to develop procedures that will help maintain organization. This is best accomplished by managing the receipt of your chemical inventories. Using the list below as a guide, formalize your own Receiving System. Make sure these procedures are followed every time a new chemical enters your laboratory:

- Date each new chemical upon receipt.
- Label each new container with a colored label or tape according to the chemical categories outlined in Step 1.

- Enter the new chemical into a "Chemical Inventory Spreadsheet" on your computer: this inventory list should be arranged alphabetically and should contain the following information about each chemical: name of chemical, amount of chemical stored (container size), date received, hazard rating, manufacturer name, MSDS location and designated storage location.
- Store the chemical in the location designated for that chemical category.
- Develop a new habit: each time you put a new chemical away, do a quick sweep of the storage area; take a moment to dispose of outdated or unnecessary chemicals as well as any chemicals with deteriorated or illegible labels.