



ENVIRONMENTAL HEALTH AND SAFETY | HAZARDOUS MATERIALS

Potentially Explosive Compounds

Potentially explosive compounds should be inspected regularly and discarded before they become a significant safety hazard. Chemical inventories and physical bottles need to be reviewed for any potentially explosive compounds in the laboratory. The list of potentially explosive compounds below is not complete, therefore attention should be given to any explosive potential warnings on the chemical's labels.

If a chemical compound has exceeded its recommended shelf life or shows signs that it may be unstable such as discoloration, crystallization, layering, water loss, or age please contact Environmental Health and Safety (EHS) at (303)724-0345 to arrange for immediate disposal.

Laboratory personnel should use the following guidelines while sorting through a chemical inventory for expired or outdated chemical reagents:

- Never work alone and always use appropriate personnel protective equipment (PPE).
- Identify the location of emergency showers and eyewash stations and ensure that they are operational and not blocked.
- Never touch an old chemical container which holds a peroxide forming solvent if there are any traces of solid crystals around the lid or if solid crystals are visible inside the container. Solid peroxide crystals are usually shock and friction sensitive and touching them may set off a violent explosion.
- Handle old or suspected peroxide forming solvent container with extreme care and avoid unnecessary motion or bumping of the containers since peroxide crystals are very unstable.
- Do not attempt to open old, outdated containers of peroxide forming solvents because they may have crystals especially in the threads of the lid.
- Contact EHS immediately if a peroxide forming solvent container has visible crystals present or if the container is over five years old.
- For those potentially explosive chemicals which are not an immediate explosive hazard and are no longer needed, complete a chemical waste disposal form to have the chemical properly disposed of through EHS.

Particular chemicals of concern include:

Picric acid. Solid picric acid (trinitrophenol) is shipped from the manufacturer with 30% water added to minimize its potential to detonate. When it becomes dry, picric acid becomes an explosive hazard. Picric acid forms shock sensitive explosives on contact with metals, therefore a container with a metal lid may pose a greater explosive hazard if the container is old.

Sodium azide. Sodium azide forms shock-sensitive explosives on contact with metal, therefore a container with a metal lid may pose a greater explosive hazard if the container is old.

Ethers and other peroxide forming solvents. Most peroxide forming solvents form shock-sensitive explosive peroxide compounds on exposure to atmospheric oxygen; a process accelerated by exposure to light or heat. Organic peroxides are among the most hazardous substances handled in the laboratory due

to their instability and shock-sensitive nature. Manufacturers usually mark ether containers with an expiration date. Bottles need to be marked with receipt and expiration dates. Ethers and peroxide forming solvents must be removed from a laboratory before the expiration date by completing a chemical waste form with EHS.

Additional Examples of Potentially Explosive Compounds:

Potentially Explosive Solid Compounds

benzoyl peroxide (dry), 2,4-dinitrophenol, 2,4-dinitrophenyl hydrazine, hexanitrodiphenylamine (dipicrylamine), 1-methyl-3-nitro-1-nitrosoguanidine, nitrogen trichloride, nitrocellulose, pyroxylin, solid picric acid (dry) or trinitrophenol, picramide, picryl chloride (trinitrochlorobenzene), picrylsulfonic acid (trinitrobenzenesulfonic acid), trinitrobenzene, sodium amide, potassium metal (old)

Potentially Explosive Organic Solvents

acetaldehyde, diazald, dioxane, ether, ethyl ether, furan, isopropyl ether, N-methyl-N-nitroso-p-toluenesulfonamide, tetrahydrofuran (THF), vinyl ethers