

Standard Operating Procedure		Page 1 of 5
Peroxide Forming Chemicals		
Investigator: General Safety	Location: EHS	Revision: 00

1.0 PURPOSE:

Materials that are susceptible to peroxide formation (i.e., autooxidation) are ones that typically react with air, moisture or impurities and produce a change in their chemical composition in normal storage. The peroxides that form are less volatile than the solvent itself and thus tend to concentrate. This is particularly dangerous if peroxides are present during a distillation, where the applied heat to the concentrated solution may trigger a violent explosion. Equally dangerous is to allow a container of this material to evaporate to dryness, leaving the crystals of peroxide at the bottom of the container.

2.0 SCOPE:

This procedure applies to all Louisiana State University Personnel that use and store peroxide forming chemicals. This standard operating procedure (SOP) is intended to provide general guidance on how to safely and store peroxide formers. This SOP is generic in nature and only addresses safety issues pertaining to stability hazards of chemicals. If you have questions concerning the applicability of any item contact the Principal Investigator/Laboratory Supervisor of your laboratory or Environmental Health and Safety.

3.0 RESPONSIBILITIES:

Only trained and qualified personnel shall be allowed to work with peroxide forming chemicals. Supervisors are responsible for ensuring that personnel are trained to in the safe use of reactive chemicals.

4.0 DEFINITIONS:

4.1 **Organic peroxides** are among the most hazardous substances used in the laboratory - both fuels and oxidizers in one. They are typically low power explosives and very easy to initiate through sparks or shocks. Materials that are susceptible to peroxide formation (i.e., autooxidation) are ones that typically react with air, moisture or impurities and produce a change in their chemical composition in normal storage. The peroxides that form are less volatile than the solvent itself and thus tend to concentrate. This is particularly dangerous if peroxides are present during a distillation, where the applied heat to the concentrated solution may trigger a violent explosion. Equally dangerous is to allow a container of this material to evaporate to dryness, leaving the crystals of peroxide at the bottom of the container. Some materials, such as ethers, form peroxides when exposed to air or light. Date these containers when new and dispose as hazardous waste within six months.

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- 6.1 Minimize the quantity of peroxides kept in the lab.
- 6.2 Carefully review all cautionary material supplied by the manufacturer prior to use.
- 6.3 Segregate these compounds from others that could create a serious hazard to life or property should an accident occur.
- 6.4 Never return unused quantities back to the container (contamination!).
- 6.5 Cleanup all spills immediately.
- 6.6 Dilution of the organic peroxide with the appropriate inert solvent (aliphatic hydrocarbons, as an example) helps to reduce the sensitivity of the peroxide to shock and heat.
- 6.7 Avoid evaporation or distillation!
- 6.8 Avoid contact with any metal source, such as spatulas, because metals can promote explosive decomposition. Use Teflon coated or ceramic instead.
- 6.9 Ignition sources in the area of peroxide use must be prohibited.
- 6.10 All sources of friction and grinding must be avoided. This includes the use of glass containers with screw on caps (crystals may form in the threads) or glass stoppers (glass against glass friction).
- 6.11 Store peroxides at the lowest possible temperature consistent with their solubility or freezing point. Do not freeze or cause the peroxide to precipitate out, however, since this is the most dangerous state!

7.0 Disposal of Peroxide Forming Chemicals

- 7.1 Peroxide forming material that have been dated and are due for disposal, file a hazardous waste pickup request. EHS will schedule a pick up.
- 7.2 Never move a suspect container of peroxide forming material. Look at the material to determine the condition of the container. Stains, rust, deformed cans are all indication of age.
- 7.3 Call EHS to review the material.

8.0 CONTINGENCIES:

- 8.1 In case of a fire, explosion, or gas leak evacuate individuals from the area and call the emergency response (911). Notify supervision and adjacent personnel as quickly as

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