

# Spotlight On Safety

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## MINIMIZING PEROXIDE FORMATION

There is a great deal of uncertainty regarding the hazards and safe handling of peroxidizable organic chemicals. **Peroxides may explode when concentrated by evaporation or distillation, combined with compounds that create a detonable mixture, or when disturbed by heat, shock or friction.** A wide variety of organic compounds spontaneously form peroxides by a free-radical reaction with molecular oxygen in a process of auto-oxidation. Although ethers are the most common, many other moieties can go through the same process.



### *Storing Peroxide Formers*

- Label the containers with the date of receipt and date it is first opened
- Time-sensitive materials should be marked with a tag that identifies them easily
- Ethers and other organic peroxide formers should be stored in cans, amber bottles, or other opaque containers, and ideally under a blanket of inert gas
- It is preferable to use small containers that can be completely emptied rather than take small amounts from a large container over time
- No materials can be used or tested after the manufacturers' expiration date unless evidence of current stability has been obtained by direct testing before the expiration date
- If material is more than 1 year past label expiration date, minimize handling and **DO NOT OPEN OR TEST!**
  1. Isolate the container from possible inadvertent use until picked up
  2. If the material is very old or shows evidence of conversion to a hazardous status (crystalline materials in or under cap of ethers), do not move the container!
  3. Submit a waste disposal request immediately through WASTE.

### *Minimizing Peroxide Formation*

- Any peroxidizable chemical with visible discoloration, crystallization, or liquid layers must be treated as potentially **explosive** - call EH&S for immediate assistance
- Label all containers of peroxide-forming chemicals with date received and opened. The label shown below may be used for this purpose
- **Always** store flammable materials that require refrigeration in a refrigerator approved for flammable storage (lab-safe) although it may increase peroxide formation
- Use or discard containers by the manufacturer's expiration date
- Keep an inventory of peroxide-forming chemicals in the lab - **Never** purchase large containers if the quantity exceeds your actual need within the 3-12 month expiration period
- **Never** distill to dryness - always leave at least 20% of still bottoms. Adding a non-volatile organic compound (mineral oil) can dilute the peroxides remaining after distillation
- **Never** force open a rusted/ stuck cap on a container of a peroxide-forming chemical
- **Never** scrape/ scrub glassware or containers if you see an oily or crusty residue

Contact EHS at 951-827-5528 if you have any questions regarding minimizing peroxide formation and peroxide storage.