

Organic Peroxides

1. Process

- a. Working with and synthesizing organic peroxides.

2. Describe process, hazardous chemical, or hazard class

- a. An organic peroxide is a carbon-based compound containing a “peroxy” group (two oxygen atoms joined together -O-O-). All organic peroxides will burn vigorously, and once ignited will be difficult to extinguish. Some organic peroxides decompose very rapidly or explosively when exposed to heat, friction, mechanical shock, or contamination with incompatible materials.
- b. The Globally Harmonized System (GHS) of classification and labeling of chemicals has seven categories for organic peroxides, which are described below.
 - i. Type A – An organic peroxide that can detonate or deflagrate rapidly;
 - ii. Type B – An organic peroxide that does not detonate or deflagrate rapidly but is capable of undergoing a thermal explosion;
 - iii. Type C – An organic peroxide that possesses explosive properties but will not detonate, deflagrate or thermally explode; and
 - iv. Types D through F – Organic peroxides that have shown hazards such as partial detonation, etc., when tested in a laboratory but do not possess these hazards under normal conditions.

3. Potential Hazards

- a. Organic peroxides are strong oxidizing agents.
- b. Can be explosive in the presence of heat or metal salts.
- c. Can spontaneously explode in high concentrations or upon agitation (shaking or stirring).

4. Personal Protective Equipment

- a. Wear shatter resistant safety goggles.
- b. Wear a 100% cotton laboratory coat.
- c. Wear gloves when handling organic peroxides. Check compatibility with the specific chemical and the glove type you are using. Nitrile will often work, but it is not compatible with some organic peroxides.

5. Engineering Controls

- a. All work with organic peroxides should be performed behind a blast shield in a fume hood.
- b. Reactions performed with organic peroxides should be done on a small scale.

6. Special Handling Procedures and Storage Requirements

- a. Treat all organic peroxides as potential explosives.

- b. Work on a small scale.
- c. Do not store organic peroxides for extended periods of time.
- d. Avoid contact with redox active metal salts and heat.
- e. Organic peroxides can be shock-sensitive, avoid excessive handling if possible.
- f. Avoid contact with other organic materials that contain ketone, aldehyde, and ester functional groups.
- g. They can be stored in a flammable cabinet but they should be given their own secondary containment to prevent contact with incompatibles.
- h. Minimize working with concentrated solutions of peroxide containing material.

7. Spill and Accident Procedures

- a. Small spills: Do not attempt cleanup if you feel unsure of your ability to do so or if you perceive the risk to be greater than normal laboratory operations. Treat the spill immediately by slowly adding reducing agents like aqueous solutions of sulfites, bisulfites (sodium bisulfite), or thiosulfates (sodium thiosulfate) if spill is contained in a well ventilated area like a fume hood.
- b. Large Spills: Notify others in area of spill. Turn off ignition sources in area. Evacuate area and post entrance ways to spill area. Call NAU Police at 523-3000 for spill response. Restrict person from area of spill or leak until cleanup is complete. Remain in area in safe location to assist the EH&S response.

8. Decontamination Procedures

- a. Decontaminate by slowly adding reducing agents like aqueous solutions of sulfites, bisulfites (sodium bisulfite), or thiosulfates (sodium thiosulfate).

9. Waste Disposal Procedures

- a. Contact EH&S for waste disposal.

10. Safety Data Sheet Location

- a. Safety Data Sheets can be found via the link on EH&S' web site:
<http://www.research.nau.edu/compliance/orc/>