

Organic Peroxides Safe Handling Guideline

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URL: <http://www-group.slac.stanford.edu/esh/eshmanual/references/chemsafetyGuidePeroxides.pdf>

Synonyms

None, will vary based on individual chemicals

Reactivity and Physical Concerns

Organic peroxides can be explosive, corrosive, and toxic and present extreme fire hazards. They are also strong oxidizing agents and combustible materials contaminated with most organic peroxides can catch fire very easily and burn very intensely. Many organic peroxides give off flammable vapors when decomposing. Because they combine both fuel (carbon) and oxygen in the same compound, some organic peroxides are dangerously reactive. They can decompose very rapidly or explosively if they are exposed to only slight heat, friction, mechanical shock, or contamination with incompatible materials.

Storage of some chemicals can form explosive organic peroxides spontaneously. Generally the types of chemicals that may form peroxides include aldehydes, ethers and unsaturated hydrocarbon compounds (allyl compounds, haloalkenes, dienes, monomeric vinyl compounds, vinylacetylenes, and unsaturated cyclic hydrocarbons like tetrahydronaphthalene and dicyclopentadiene). If crystals are seen in containers, **do not handle** - these peroxides can be extremely shock sensitive and explosion is possible.

Exposure Hazards

Routes of Exposure

Inhalation, ingestion, skin contact, eye contact

Many organic peroxides are toxic and can produce allergic response and eye damage. Individual chemical health hazards may vary greatly and it is very important to consult the manufacturer's SDS for potential health hazards.

Chronic Exposure

Chronic exposures to organic peroxides will vary greatly and can range from liver and kidney damage to respiratory illnesses such as pneumonia. Consult the individual chemical's SDS for specific chronic hazards.

First Aid

First aid measures will vary based on the individual chemicals hazard properties. Call 911. In all cases, always remove any contaminated clothing due to the fire hazard present. Obtain medical attention immediately. (See [Chemical Safety: Accidental Exposure Requirements](#) [SLAC-I-730-0A09S-041].)

Exposure Limits

Exposure limits will vary based on individual chemical hazards, consult the manufacturer's SDS for established exposure limits.

Exposure Controls

Engineering Controls

Local exhaust ventilation or breathing protection is required. Explosion proof electrical equipment and construction materials compatible with organic peroxides are required. Ensure all incompatible exhaust streams are segregated. Store all materials in appropriate containers. Secondary containment of all storage and use is required.

Organic peroxides should be stored in sealed, air-impermeable containers. In most cases, dark amber glass with a tight fitting cap is acceptable. Do not store organic peroxides in containers with loose fitting caps or ground-glass stoppers. Plastic containers are not recommended. Diethyl ether should be stored in steel containers, because the iron tends to neutralize peroxides.

Administrative Controls

Procedures should be developed for the safe use and handling of organic peroxides in all applications. ESHQ can provide information and guidance. Ensure procedures comply with all manufacturer's recommendations regarding storage conditions and time limits/chemical expiration dates. Personnel working with the materials must receive detailed training on the hazards, safe use, and emergency procedures.

Establish a regular inventory check to remove older chemicals from inventory, label new chemicals, and ensure each chemical is properly stored. Information on each label should include: date received, date opened, responsible person, and expiration date. If no expiration date is provided by the manufacturer, it should be recorded as six (6) months from the date received.

Personal Protective Equipment

Avoid all contact with substances. Follow [SDS](#) recommendations for PPE. In general, prevent skin/eye contact through the use of impervious gloves, clothing, boots, apron, and eye goggles or full face shield.

Avoid breathing dusts, mists or vapors. If the airborne concentration limits are exceeded and engineering controls are not feasible wear a NIOSH-approved self-contained breathing apparatus with full face-piece operated in the pressure demand or other positive pressure mode.

Disposal

Organic peroxides are generally regulated as hazardous waste. Containers and other materials that are contaminated with organic peroxides must also be treated as hazardous waste and handled in a safe manner due to the unusual stability issues related to organic peroxides. Contact the Waste Management Group for specific disposal requirements and procedures.

Medical Monitoring (if applicable)

Medical monitoring will vary depending on the individual chemical's hazards. Consult the SDS or chemical safety program manager for the appropriate medical monitoring.

Emergency Response

In the event of a spill that poses a threat to health and/or the environment, immediately evacuate the area and call 911. Then call SLAC Site Security (ext. 5555 or 650-926-5555 from a cell phone) and notify your supervisor.

For other spills, notify your supervisor then SLAC Site Security; these may be cleaned up with appropriate spill response supplies by trained personnel who have been authorized via work

planning and control. (See [Spills: Response, Cleanup, and Reporting Procedure](#) [SLAC-I-750-0A16C-006].)

Standards and Regulations

- OSHA. PEL: [29 CFR 1910.1000 Table Z-1](#); Respiratory Protection: [29 CFR 1910.134](#)
- EPA. Release: [40 CFR 355.40](#); Waste: [40 CFR 261.21-261.24](#)
- *California Fire Code*, Chapters 27 through 41 ([24 CCR Part 9](#))

Other References

- NLM. [TOXNET: Toxicology Data Network](#)
- CCOHS. [OSH Answers: How Do I Work Safely with Organic Peroxides?](#)
- UC Berkeley, Office of Environment, Health & Safety. [Guidelines for Explosive and Potentially Explosive Chemicals Safe Storage and Handling](#)