

Chemicals that form peroxides require special care. The materials listed on the front of this brochure are the most commonly used peroxide-formers at Ames Laboratory. The Iowa State University Chemical Hygiene Plan has an extensive list of peroxide-forming chemicals. As with any chemical – **KNOW THE HAZARDS OF THE MATERIALS YOU ARE USING.**

All research activities at Ames Laboratory require approval by the Safety Review Committee. The procedure used for this approval is **READINESS REVIEW**. Make sure the activity you are working on has been approved via the Readiness Review procedure and that you are authorized to be performing work. Ask your supervisor.

Here are some general recommendations for work with peroxide-forming materials:

Personal Protection

Eye Protection: Chemical resistant splash goggles or glasses which are impact resistant.

Gloves: Check the MSDS but nitrile or neoprene work for many of these chemicals.

Ventilation: Use in a hood with at least 100 fpm face velocity and work with the sash at that approved height.

Respirator: A respirator should not be necessary; to discuss the need for a respirator consult ESH&A.

Clothing: Lab Coat

Handling Precautions

- Minimize the amount of peroxide-formers in the lab; purchase the amount that you will be accepted to consume in a year.
- The date received shall be marked on each container.
- The following materials should be **disposed of after 3 months**: isopropyl ether, divinylacetylene (DVA), potassium metal, sodium amide, vinylidene chloride, potassium amide.
- **All other peroxide-forming materials should be disposed of 6 months after opening or 12 months after purchase.**
- Test for peroxide formation periodically. Consult ESH&A for testing methods.
- When using flammable materials, avoid open flames and sources of heat.
- Evaporation or distillation of peroxide forming compounds **is not** recommended.
- If evaporation or distillation is required, **NEVER DISTILL TO A DRY RESIDUE**. Use recommended procedures for these processes.

Storage/Disposal

- Store away from heat and light.
- Storage of flammables shall be in an approved refrigerator.

- Ensure that all caps and closures are securely sealed during storage to prevent evaporation and concentration.
- Implement a procedure by which storage dates for peroxide-forming chemicals are periodically checked and expired materials are earmarked for disposal.
- Peroxide formers that have passed the 6 or 12 month storage dates should be disposed of by calling ESH&A at 4-2153.

Spill Remediation

- Use an inert absorbent to contain the spill. Absorbent and solvent should be disposed using the approved waste disposal procedures.
- If a spill is beyond your ability to handle, contact ESH&A at 4-2153 for assistance.
- Notify your supervisor of any spill that has occurred.

First Aid

- If skin contact should occur, wash with soap and water to remove solvent; for eye contact, irrigate for 15 minutes.
- For excessive inhalation exposures, remove to fresh air.
- Contact Occupational Medicine, G11 TASF, if an exposure has occurred.

Physical Properties of commonly used Peroxide-Forming Chemicals at Ames Laboratory

DIETHYL ETHER

CAS#: 60-29-7
Formula: $\text{H}_3\text{CH}_2\text{COCH}_2\text{CH}_3$
Synonyms: Diethyl Ether
Molecular Weight: 74.62
Appearance: Volatile, mobile, flammable liquid. Has a characteristic sweetish odor.
Vapor Density: 2.55 Water = 1.0
Boiling Point: 34.6°C

DIOXANE

CAS#: 123-91-1
Formula: $\text{C}_4\text{H}_8\text{O}_2$
Synonyms: 1, 4-Diethylene Dioxide
Molecular Weight: 88.10
Appearance: Volatile, flammable liquid, with a faint pleasant odor.
Density: 1.03
Boiling Point: 101.0°C

ISOPROPYL ETHER

CAS#: 108-20-3
Formula: $(\text{H}_3\text{C})_2\text{CHOCH}(\text{CH}_3)_2$
Synonyms: Diisopropyl Ether
Molecular Weight: 102.17
Appearance: Volatile, mobile, flammable liquid. Has an ether-like odor.
Density: 0.726
Boiling Point: 68-69°C

TETRAHYDROFURAN

CAS#: 109-99-9
Formula: $\text{C}_4\text{H}_8\text{O}$
Synonyms: Diethylene Oxide
Molecular Weight: 72.10
Appearance: Volatile, mobile, flammable liquid. Has an ether-like odor.
Density: 1.407
Boiling Point: 66°C

References

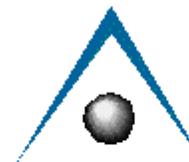
ISU Chemical Hygiene Plan, Environmental Health & Safety, 1997.

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Handling And Use Of Chemicals, Ethers, in CRC Handbook of Laboratory Safety, 3rd ed., Furr, A.K., Ed., CRC Press, Boca Raton, FL., 1990., p. 237-241, 285-288

National Safety Council, Recognition and Handling of Peroxidizable Compounds. Data Sheet 1-655 Rev. 87, Chicago, IL., 1987

(NOTE: This information is not intended to replace the Material Safety Data Sheet. Always have a current, vendor-specific, hard-copy MSDS in your lab for each chemical.)



AMES LABORATORY

PEROXIDE-FORMING CHEMICALS

INCLUDING:

Diethyl Ether

Dioxane

Isopropyl Ether

Tetrahydrofuran

