

OVERVIEW

Diethyl ether, also known as ethyl ether or ether, is a volatile, colorless liquid commonly used as a laboratory solvent. Diethyl ether is a Class B peroxide former with a shelf life of 12 months from receipt when unopened or 6 months after opening, whichever occurs first.

Peroxide forming chemicals must be consumed or disposed of within this timeframe, as oxidation and concentration via evaporation of these chemicals may result in the formation of explosive peroxide compounds. These peroxide compounds form crystals that are shock-sensitive and may detonate explosively when subjected to thermal or mechanical shock. Shocks as minimal as unscrewing a cap containing peroxide residues may be enough to trigger detonation, which highlights the importance of proper dating, disposal, and inspection of potential peroxide forming chemicals.

POTENTIAL HAZARDS



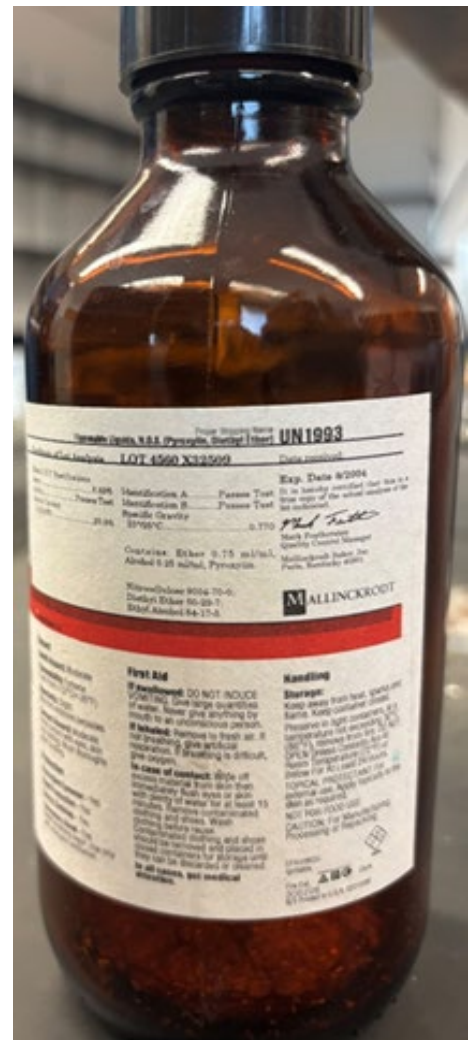
WHAT HAPPENED?

ABANDONED EXPIRED PEROXIDE FORMER

During the closeout walkthrough of a research laboratory on campus, Environmental Health and Safety coordinators discovered a metal travel case containing chemicals belonging to a previous occupant of the lab space. Among these chemicals was a bottle of Collodion which is an Alcohol, Pyroxylin, and Diethyl Ether solution. The bottle was not labeled with a “received date” or “opened date” but had a manufacturer-printed expiration date of August 2004 and a warning about potential formation of explosive peroxide crystals. Within the bottle, the solution had evaporated and a “hockey puck” sized layer of crystals was visible.

Upon discovery, the EH&S coordinators identified the hazard of potential peroxide crystal formation, carefully placed the bottle on the lab bench, alerted the university’s Chemical Hygiene Officer and Hazardous Materials Team.

Due to the improper storage of this bottle, lab users and EH&S coordinators were placed at risk of serious injury.



WHAT CORRECTIVE ACTIONS WERE TAKEN?

- The expired diethyl ether was secured, and a third party was contracted for disposal.

HOW CAN INCIDENTS LIKE THIS BE PREVENTED?

- Proper dating the peroxide formers:** Peroxide formers should be labeled in accordance with the guidance in our EHS website. The current UF policy is that peroxide formers must be disposed of after 12 months from the date received; 3 months after opening for Category A; and 6 months after opening for Categories B & C.
- Training and Awareness:** Principal Investigators (PI) should provide targeted training for all lab personnel on labeling, handling, and disposing of peroxide-forming chemicals.
- Maintain an accurate inventory:** The chemical inventory must be updated annually or as needed – whichever is first.
- Inspect your areas:** Conduct routine inspections to identify and safely dispose of outdated chemicals.
- Follow closeout procedures:** Promptly notify Environmental Health and Safety (EH&S) when a Principal Investigator (PI) plans to vacate a lab and ensure that all corrective actions identified during the EH&S closeout inspection are completed.
- When in doubt ask questions:** Ask your PI or EH&S Lab Safety. For additional information visit: [Peroxide Forming Compounds – UF | EHS](#)

Resources

National Research Council, Prudent Practices in the Laboratory, National Academy Press: Washington, DC, 1995.

Kelly, R.J. "Review of Safety Guidelines for Peroxidizable Organic Chemicals," Chemical Health & Safety-American Chemical Society–, 1996, 4(5), 28-36.