



Oxidizers Fact Sheet

This fact sheet is for general safety awareness. Individual Standard Operating Procedures for all experiments and processes involving oxidizers must be developed by the laboratory.




PROPERTIES & HAZARDS

Oxidizers can be solids, liquids, or gases. They react strongly with organic materials and reducing agents. Most oxidizers readily give off oxygen, but some can give off other oxidizing substances like fluorine or chlorine, which can intensify a fire.

The presence of oxidizers can make a fire start more easily. They can expand the flammability range of gases and liquids and lower ignition temperatures for combustible materials.

There are three categories for oxidizing liquids, Category 1, 2 and 3; three categories for oxidizing solids, Categories 1, 2 and 3; and one category for oxidizing gases, Category 1. On safety data sheets (SDS) or material bottles in Section 2 – Hazard Identification, a combination of the following hazard classifications, pictograms and hazard statements will be listed indicating an oxidizing hazard. More information on material hazards can be found in complete hazard statements on the SDS or material bottles.

Note: The oxidizing pictogram looks similar to the flammable/combustible pictogram. These should not be confused because they are incompatible, so should be stored separately.

Hazard Classification and Category	Pictogram	Hazard Statement
Oxidizing Liquids – Category 1, 2 and 3		May cause or intensify fire May cause fire or explosion May intensify fire
Oxidizing Solids – Categories 1, 2 and 3		May cause or intensify fire May cause fire or explosion May intensify fire
Oxidizing Gases – Category 1		May cause or intensify fire May cause fire or explosion

CONTROLS

Engineering Controls

- Chemical fume hood

Personal Protective Equipment

- Gloves
- Splash goggles
- Clothing that leaves no exposed skin on legs or feet
- Closed-toe shoes that fully cover the top of the foot
- Chemical Resistant Apron*
- Face Shield*

**For work with large volumes of oxidizers and/or when pouring*

STORAGE

- Maintain segregation of oxidizers from organic or flammable chemicals, reducing agents, and combustible material.

- Containers of liquid oxidizers should be stored in unbreakable secondary containment tubs or trays separate from materials with other hazard classifications.
- Store oxidizers away from sources of heat.

USE

- Handling of oxidizers should be performed in a chemical fume hood.
- Keep work area clear of heat, unnecessary organic chemicals, reducing agents, and flammable or combustible material.
- Use smallest quantity necessary or use dilute solutions of oxidizing chemicals when possible.
- Never return excess reagent back into the original chemical container.
- For oxidizing compressed gases, make sure all tubing, regulators, and gauges are compatible with the gas. Do not use hydrocarbon-based greases or lubricants with oxidizing gases.

Waste

- Waste should be managed so that incompatible materials are not mixed. Storage of oxidizer waste should be segregated from organic, reducing, and combustible waste and waste streams clearly labeled to prevent accidental mixing of incompatible waste streams.
- Waste containers should be compatible with their contents and should be segregated by hazard class into separate secondary containers.
- For questions regarding waste management contact ESSR, Environmental Affairs at envaffairs@umd.edu.

SPILL CLEANUP

- Spill cleanup must follow the items specified in the Emergency Response Guide posted in the laboratory.
- If the laboratory is equipped and personnel are trained, minor spills can be handled by laboratory personnel.
- If a spill is beyond the capacity of the laboratory to address, call (301) 405-3333 from a safe location.

REFERENCES AND ADDITIONAL RESOURCES

1. OSHA [A Guide to the Globally Harmonized System of Classification and Labeling of Chemicals \(GHS\)](#)
2. [Prudent Practices in the Laboratory: Handling and Management of Chemical Hazards](#), National Academy Press, Washington, DC, 2011
3. [Oxidizers Hazard Class Standard Operating Procedure](#), University of Arizona, Research Laboratory & Safety Services
4. [SOP: Strong Oxidizers](#), University of Pennsylvania, Environmental Health & Radiation Safety
5. [Standard Operating Procedure – Strong Oxidizers](#), Yale, Environmental Health & Safety Department