HARVARD
Campus Services
ENVIRONMENTAL HEALTH & SAFETY

LABORATORY SAFETY GUIDELINE

Hydrogen Peroxide [CAS No. 7722-84-1]

All hydrogen peroxide (solutions of 10% or greater) users at Harvard must review this document and should contact their EHS Laboratory Safety Advisor and department safety officer prior to using this substance. Hydrogen peroxide is a clear liquid with a slightly pungent, irritating odor and a low vapor pressure (5 mm Hg at 30°C). It is also a strong oxidizer.

HAZARDS

	Contact with aqueous solutions of hydrogen peroxide of less than 50% causes skin irritation, but more concentrated solutions are corrosive to the skin. Hydrogen peroxide solutions of 10% or greater are corrosive to the eyes and can cause severe, irreversible damage and possibly blindness.
	Hydrogen peroxide is moderately toxic by ingestion and slightly toxic by inhalation.
	Hydrogen peroxide is a strong oxidizer and may cause a fire or explosion. Contact with many organic compounds, including common acetone, can lead to immediate fires or violent explosions. Hydrogen peroxide reacts with certain organic functional groups (ethers, acetals, etc.) to form peroxides, which may explode upon concentration. Explosions may also occur upon exposure of hydrogen peroxide to metals much as sodium, potassium, magnesium, copper, iron, and nickel.

PRECAUTIONS

Before starting work:

- Determine if you can use a less hazardous substance in place of hydrogen peroxide;
- Review the manufacturer's Safety Data Sheet and additional chemical information at http://www.ehs.harvard.edu/safety-data-sheets-sds;
- Ensure that a written experimental protocol including safety information is available;
- Be familiar with general University emergency procedures in the EHS Emergency Response Guide;
- Order the most dilute solutions available that will meet experimental needs. Order only the quantity that you need;
- Identify the location of the nearest eyewash and shower and verify that they are accessible;
- Locate and verify that appropriate hydrogen peroxide spill cleanup materials are available, including the following:
    - polypropylene absorbent pads or equivalent; and
    - polypropylene containers that can hold the pads and be sealed tightly;
    - **NEVER** use paper towels or paper products to absorb an oxidizer like hydrogen peroxide
- Do not work alone! Ensure another person who is familiar with your work and hydrogen peroxide hazards is in the area.

During work:

- AVOID INHALATION! Hydrogen peroxide has a low vapor pressure so it can be used outside of a fume hood so long as it is not being heated or aerosolized in some way. If heat or other aerosol-generating processes are required, perform this work in a fume hood.
- AVOID CONTACT! Use appropriate personal protective equipment (PPE):
    - Wear a lab coat, long pants, shirt and closed-toed shoes.
    - If you anticipate more than incidental hand contact with hydrogen peroxide, use nitrile/neoprene gloves with a minimum thickness of 7.8 mil. If you anticipate only incidental hand contact with hydrogen peroxide, use double-gloved standard 4-mil thick nitrile gloves.
    - Gloves must be thoroughly inspected prior to each use. Do not use damaged gloves;

- Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with hydrogen peroxide;
- Change gloves (outer and inner) at least once an hour and immediately whenever you suspect hydrogen peroxide has contacted your gloves;
- Wear chemically-protective goggles (in lieu of goggles, work behind a mostly closed fume hood sash while wearing safety glasses);
- Because of hydrogen peroxide's fire and explosion potential, the use of a blast shield is advisable and is essential for experiments involving solutions of 50% or greater of hydrogen peroxide (a fume hood sash can function as a blast shield); and
- Wash hands and forearms thoroughly with soap and water each time gloves are removed.

- Use materials and containers appropriate for hydrogen peroxide. Most plastics, including polypropylene, are compatible and work well.
- Keep all containers tightly closed when not in use and during transport.

After completing the work

- Dispose of waste hydrogen peroxide following Harvard University Hazardous Waste Procedures.
  - Hazardous Waste Classification: Corrosive/Oxidizer
- Return container to storage area following Harvard University Laboratory Chemical Storage Guide
  - Storage Group: OX (Oxidizers)
  - Store in designated plastic (polyethylene) secondary container.
  - Store in original containers or other appropriate containers.
- Wash hands and forearms thoroughly with soap and water before leaving the lab.

EMERGENCY PROCEDURES

First Aid

SKIN CONTACT
- Flush skin with water for 15 minutes using the closest available sink, portable drench hose or safety shower. Remove any exposed clothing as well as any jewelry that may be trapping hydrogen peroxide;
- Call 911 on a landline phone for medical assistance (or provide location if calling on a mobile phone).

EYE CONTACT
- Using eyewash, flush eyes while holding eyelids open;
- Call 911 for medical assistance;
- Continue flushing eyes with water until emergency medical personnel arrive.

INHALATION
- If hydrogen peroxide mist or vapors are inhaled, immediately move to get fresh air;
- Call 911 for medical assistance.

INGESTION
- Do not induce vomiting;
- Call 911 for medical assistance;
- Rinse mouth with water if conscious;
- Never give anything by mouth to an unconscious person.

Spill Response

OUTSIDE FUME HOOD OR VENTILATED ENCLOSURE
- Alert others and evacuate to a safe distance and prevent entry.
- Contact the University Operations Center at (617) 495-5560 [HMS/HSDM (617) 432-1901]
- Remain in a safe location until EHS or other response personnel arrive.

INSIDE FUME HOOD OR VENTILATED ENCLOSURE (< 500 ml)
- Contact the University Operations Center at (617) 495-5560 [HMS/HSDM (617) 432-1901]
- If trained and confident, apply polypropylene absorbent pads or equivalent from the hydrogen peroxide spill kit. **NEVER** use paper towels or paper products to absorb an oxidizer like hydrogen peroxide. During clean-up, ensure you are wearing PPE described above including goggles.
- Otherwise close the fume hood sash and await support.