

Standard Operating Procedure (SOP)			
<i>Title:</i> LIQUID NITROGEN			
<i>Approved by:</i>		<i>Effective Date:</i>	
David A. Brown, Director, EH&S		<i>Revised Date:</i>	
		<i>Section:</i>	CHEM

1. Purpose

- Use of liquid nitrogen in a laboratory environment.

2. Physical Hazards

- Simple asphyxiant.
- Non-toxic but may cause suffocation by displacing air.
- Causes severe frostbite.

3. Health Hazards

- Freezes tissue.
- Causes severe cryogenic burns to eyes and skin.

4. Personal Protective Equipment

- EYE PROTECTION
 - Safety glasses, goggles or face shields must be worn during operations in which liquid nitrogen might contact the eyes (e.g., through vapors or splashes of solution).
 - Ordinary (street) prescription glasses do not provide adequate protection. Adequate safety glasses must meet the requirements of the Practice for Occupational Education Eye and Face Protection (ANSI Z87.1-2003) and must be equipped with side shields.
 - Wearing contact lenses under some circumstances provides workers with a greater choice of eye and face protection (such as goggles or full-facepiece respirators without prescription inserts) as well as better visual acuity. However, the risk is unknown for contact lens wearers compared with nonwearers working with chemicals listed in the NIOSH Pocket Guide to Chemical Hazards [NIOSH 2004]. OSHA recommends against contact lens use when working with acrylonitrile, methylene chloride, 1,2 dibromo-3-chloropropane, ethylene oxide, and methylene dianiline." [NIOSH Publication No. 2005-139: Current Intelligence Bulletin 59, Contact Lens Use in a Chemical Environment.](#)
- HAND PROTECTION
 - Use disposable nitrile gloves when working with chemicals.
 - Laboratory personnel should thoroughly wash hands with soap and water before and immediately upon removal of gloves.
 - Loose fitting thermal insulated or leather gloves are recommended.
- LAB COATS, ETC.
 - Lab coats, closed toed shoes and long sleeved clothing must be worn when handling liquid nitrogen to prevent any potential skin contact.
 - **An impervious full length apron should be worn when transferring liquid nitrogen.**
- SAFETY SHOWER/EYEWASH
 - Where the eyes or body of any person may be exposed to liquid nitrogen, suitable facilities for quick drench or flushing of the eyes and body must be provided within the work area for immediate emergency use.
 - Bottle type eyewash stations are not acceptable.

5. Designated Area for Use and Containment Devices

- All liquid nitrogen work must be done in the laboratory fume hood.
- The fume hood's sash must be in the position where a face velocity of 100 feet per minute is achieved.

6. Special Handling Procedures and Storage Requirements

- Store and use with adequate ventilation.
- Do not store in a confined space.
- Some metals such as carbon steel may become brittle at low temperatures and easily fracture.
- Never allow any unprotected part of body to touch un-insulated vessel.
- Never place liquid nitrogen in a sealed container or any object that could cause entrapment of the gas.
- Never mix liquid nitrogen with water or ice or pour it down the sink. Ice can solidify around it, trapping gas at high pressure.

7. Exposure Monitoring

Users of this chemical are required to notify WFUSM EH&S at 716-9375 so exposure monitoring can be performed to determine exposure level.

8. Waste Disposal

Excess liquid nitrogen and all waste material containing liquid nitrogen must be placed in a container which is stored in secondary containment with the following label "**HAZARDOUS WASTE LIQUID HYDROGEN**" and disposed through WFUSM EH&S.

9. Spill and Accident Procedures

If spill is greater than 300 ml, do not attempt to clean up the spill. Immediately report the spill to WFUBMC Security at 716-9111 and WFUSM EH&S at 716-9375.

If any exposure or contact to the chemical, rinse affected area under a safety shower/eyewash for 15 to 20 minutes, inform supervisor, and report to WFUBMC Employee Health or Emergency Department.