

**STANDARD OPERATING PROCEDURE**  
**Department of Chemistry**

**Dispensing Liquid Nitrogen**  
**(Cryogenic Liquid)**  
**Updated 07-22-08**

A cryogenic liquid is one with a normal boiling point below -150C, as defined by the National Bureau of Standards.

Designated Area:

Liquid Nitrogen is located in room 5031 WBSH. Cylinder sizes range from 160L to 240L.

Liquid Nitrogen - CAS # 7727-37-9

Personal Protection:

Wear cryogenic gloves located in cabinet to the left of cylinder.  
Lab coat and safety goggles.

Training:

Do not dispense without prior instruction.  
Unless you are faculty, see – Instructor or Ray Hoff  
Read MSDS which is in the MSDS folder located in room..

Process:

Check to see if pressure in tank is below 20 psi, if not slowly open vent valve and lower pressure to 10-20 psi. Close when done.

Check hose for cracks and breaks.

With dewar on floor, place hose in dewar to a depth of approximately one inch. Note: Hose will freeze during fill and takes 10-40 minutes to thaw.

Open liquid valve slowly and start fill at very slow rate to cool dewar.  
At this time there will be a very high boil off.

Once dewar is cooled you may increase fill speed gradually. Never open valve totally. It may freeze open.

When dewar is full, close liquid valve, let hose warm .

Remove hose and place lid/cover on dewar.

Check liquid and vent valves to confirm they are closed.

### Spill and Accident Procedure:

#### **Spill -**

Evacuate all personnel from area. Shut off flow if without risk. Avoid contact with spilled liquid and allow it to evaporate. Ventilate area. Gas may cause rapid suffocation due to oxygen deficiency.

#### **Accident-**

Inhalation: Leave room and seek fresh air.

Skin contact: Warm frostbite area with warm water (less than 105 F).

Eye contact: Immediately flush eyes with warm water for 15 minutes.

Contact Tim Styranec WBSH 5053 (x3665) or the Chemistry Dept. WBSH 5053 (x3663) for further assistance. Other emergency numbers include (x911), and EOHS (x3700).

File an Accident/Incident Report - Forms available in the Chemistry Department, WBSH 5053.

### Hazards involved in procedure:

#### **EXTREMELY COLD** liquid and gas under pressure-

Never allow any unprotected part of your body to touch uninsulated pipes or vessels containing cryogenic liquids. Flesh will stick to the extremely cold metal and will tear when you try to pull free. Exposure to liquid cryogenics or the cold "boil off" gases can result in extensive tissue damage or severe skin burns.

#### **OXYGEN DEFICIENCY**

The release of cryogenic liquids in the work area can result in the rapid displacement of air and the potential for asphyxiation (suffocation)

by reducing the concentration of oxygen in air below levels necessary to support life.

### **PRESSURE BUILD-UP**

Over-pressurization will develop in inadequately vented pressurized systems due to the expansion of cryogenic liquid vaporizing into large volumes of gas. Sudden release of this pressure can cause personal injury by issuing cold gas or liquid.

NOTE: If a large quantity of ice has formed on top of the cylinder report it immediately to Ray Hoff WBSH 5025 (330-559-7666) or Tim Styraneć WBSH 5053 (x3665).

### **Special Handling Requirements:**

Use care and caution when transporting a dewar to lab area.  
Store in cool dry place.

### **Approval Required:    **unless you are faculty****

Before conducting this operation you must have approval from Instructor or Ray Hoff .