

*STANDARD OPERATING PROCEDURE***Dry Ice**

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2030 SRTC, 5-4403  
Dec 14, 2018

**Minimum Personal Protective Equipment Required:** Cryogenic gloves, eye protection, skin and body protection (long pants, lab coat, and closed toed shoes)

**Risks:** Asphyxiation when used or stored in poorly ventilated or tightly enclosed areas; burns or frostbite; explosions if in a closed container.

- Dry ice is the solid form of carbon dioxide and will sublime (vaporize directly to the gas state) at a temperature of -78.5C (-109.3F) or higher.
  - Dry ice will sublimate about 5 to 10 pounds every 24 hours (blocks last longer) in a typical storage cooler.
  - One pound of dry ice produces about 250 liters of gaseous carbon dioxide
- Normal air is composed of 78% nitrogen, 21% oxygen, and only 0.04% carbon dioxide.
  - Concentrations of CO<sub>2</sub> greater than 0.5% (5000 ppm) can become dangerous.
  - Carbon dioxide is denser than air and may accumulate in low, confined spaces with poor ventilation.

**Special Handling:**

- ✓ Use or dispense only in well-ventilated areas.
- ✓ Never transport in the passenger area of a vehicle
- ✓ **Never place dry ice inside an ultra-low freezer or other enclosed space!**

**Protocol/Procedure:**

- General use of dry ice
  - Dry ice is used as a cooling agent and is shipped with some reagents or samples received in the lab.
  - Never touch dry ice with bare skin; use tongs or cryogenic gloves to move ice
  - If you want to keep the dry ice for later use, store it in the box it arrived in with the lid loosely on. Do not store the dry ice in a confined area, in freezers or rooms without ventilation
  - Use dry ice in open spaces with good ventilation
  - If at any point a person working with or near dry ice begins to feel unwell, have rapid breathing or cyanosis, they must leave the area immediately
  - To dispose of unneeded dry ice, let the unused portion sublimate in a well-ventilated area.
  - NEVER dispose of dry ice in a sink, the trash, or in any other device or container. The dry ice can destroy the structure because of the temperature difference.
- Shipping dry ice
  - If needed for out-going shipments, dry ice can be purchased in the chemistry stockroom at SLSRC.

- Ask Joy or Lindsay for an account number and bring a Styrofoam cooler to hold the dry ice
- Never transport in the passenger area of a vehicle.
  - If it must be transported via a vehicle, place in trunk or a location apart from the driver
  - Make sure there is good ventilation in the driver's compartment in case of leakage of CO<sub>2</sub> gas into the driver's compartment.
- Dry ice must be packaged in containers that allow the release of CO<sub>2</sub> gas
- If shipping via FedEx or UPS, a dry ice sticker must be placed on the package. These stickers can be obtained from Vanessa in the storeroom.