

## LET'S DO CHEMISTRY

# Sublimation Bubbles

## Protocols and Safe Practices for Storing, Transporting, and Using Dry Ice

Always follow and model prudent practices when doing chemistry activities. Think about:

- What **hazards** exist and what associated risks may arise from these hazards?
- How to **minimize** risks through protocols we have designed into the activities and training materials.
- How **safe practices and protocols** should best be communicated with facilitators, participants, and others.

### What is Dry Ice?

Dry ice is the solid form of carbon dioxide. It is non-combustible and is available in flakes, pellets, or block form. Dry ice will sublime (vaporizes directly to the gas state) at a temperature of  $-78.5\text{ C}$  ( $-109.3\text{ F}$ ) or higher. Be careful, cautious, and smart when storing, transporting, or using dry ice.

Dry ice is considered hazardous for three reasons:

- **Explosion hazard:** dry ice releases a large volume of carbon dioxide gas as it sublimates. If packaged in a container that does not allow for release of the gas, it may explode, causing personal injury or property damage.
- **Suffocation hazard:** a large volume of carbon dioxide gas emitted in a confined space, or other unventilated area (like a car) may create an oxygen deficient atmosphere.
- **Contact hazard:** dry ice is very, very cold and direct contact with skin can cause severe frostbite.

### Protecting Facilitators and Participants

- Always follow and model prudent practices when doing chemistry activities. All facilitators and visitors engaging with dry ice must wear goggles! Facilitators and staff should always use gloves or tongs for handling the dry ice. Do not squeeze dry ice pellets!
- Never let visitors touch dry ice. They can touch the cooled air or fog or feel a cooled surface, but do not let them touch the ice itself. Before beginning the activity, remind visitors that the dry ice is very, very cold and should not be touched. You can even ask them to “promise to not ever touch the ice.” Hold them to it!

## **SAFETY PROTOCOLS FOR DRY ICE**

### **Storage & Handling**

- Vent any container used for storing or holding dry ice. Allow some air in and out.
- Sealed or airtight containers can explode!

### **Proper Ventilation**

- Only handle dry ice in an open or well-ventilated room.
- If transporting dry ice in a car or van, keep the windows open.
- Do not carry dry ice in a passenger elevator.

### **Contact with Skin**

- If contact with skin or eyes occurs, immediately place under WARM (less than 40 degrees C) running water for 15 minutes.
- Alert a staff person.
- Do not rub the affected skin area.
- Do not use hot water or dry heat. This could cause further tissue damage.

### **Disposal**

- Do not put dry ice down the drain or in the trash can.
- Best procedure for disposal is to let it sublimate away in a large area.

Your institution may have special rules or protocols for chemistry related activities, and activities involving dry ice in particular, so check with your facilities staff, safety committee, and/or others. Learn more about safe practices in the *Let's Do Chemistry: Safety Guide* included in the physical kit and with the online digital kit resources.