

SAFE USE OF DRY ICE

Caution: Dry ice must be handled with care.

1. Dry ice must not be tasted, placed near the mouth or allowed to touch the skin, as the extremely low temperature could cause a burn.
2. Dry ice must not be placed in glass jars, bottles, or tightly sealed containers. They could explode due to the high pressure.
3. Do not breathe the gas from dry ice for an extended period in a closed area, such as a car. Store the dry ice in a container such as a styrofoam cooler until you are ready to use it.
4. When the dry ice has served its purpose and you no longer have any use for it, open the container and let the dry ice dissipate in a safe place, preferably outside where students or others will not find it and play with it.

CLOUD CHAMBER

Source Of Materials

Science supply houses have plastic containers for cloud chambers. They may also have sources that can be used. (Gas lantern mantles may be used, but they do not work as well as commercial sources, luminous dials, or uranium ore.)

Dry ice can be purchased where fire extinguishers are recharged. A CO₂ fire extinguisher can also be used. (Shooting the fire extinguisher into a burlap bag helps to reduce mess.)

Additionally, dry ice may be found at many ice suppliers listed in the "Yellow Pages" of your telephone directory. Ethyl alcohol can usually be purchased where liquor is sold.

A possible source of a Geiger counter is your local civil defense or emergency response officer, a local utility, a college or university, a firehall, or hospital radiology lab.

What To Look For

The air layer near the bottom of the jar is supersaturated with alcohol vapor. (There is more vapor in the air than is usual at the low temperature and as a result, the gas will form liquid droplets whenever it is disturbed.) Dust in the jar will cause the alcohol to condense into small droplets, which you can see as a fine mist falling to the bottom of the jar during the first half hour that you are using the chamber. After a while, however, most of the dust will have fallen to the bottom of the dish and the mist will disappear.

The tracks formed by the radiation appear to be white lines in the cloud. As the radiation passes through, it knocks electrons out of the atoms in the air. The alcohol vapor then condenses on the charged particles, forming little "storms" along the path. These tracks disappear almost immediately.

Students may be able to find three kinds of tracks. (See activity sheet.)

After a while the tracks will become faint because the radiation has affected so many of the atoms in the jar. When this happens, rub the top of the jar briskly with the cotton or silk cloth. The static electricity that is produced will clear the jar and cause the tracks to become visible again.