

## CO<sub>2</sub> Leaky Faucet by: William C. Deese

**Description:** Carbon dioxide is passed through a series of PVC pipes assembled in a faucet shape. Large, foggy soap bubbles form and fall from the faucet.

**Materials:** Dry ice and protective gloves  
2-L plastic bottle, paper towel, rubber band, plastic cup  
Three lengths of 3/4 inch PVC pipe (24", 12", and 4")  
Two elbow joints  
One 3" length of plastic tubing (1" O.D.)  
Tall ring stand and clamps  
Soap solution

**Procedure:**

- 1) Assemble the apparatus as shown below and place it on the desk top. (see [www.deadchemistsociety.com/leakyfaucet.html](http://www.deadchemistsociety.com/leakyfaucet.html))
- 2) Fill the bottle half-full with warm water.
- 3) Briefly hold the cup of soap solution up to the mouth of the faucet to wet the paper towel. You should see a soap film covering the opening.
- 4) Drop the dry ice into the bottle and cover the hole with your hand.
- 5) Observe the formation of the foggy bubbles as they fall from the faucet.

**Discussion:** Dry ice sublimates directly into carbon dioxide gas. This gas is quite cold and when it comes in contact with the warm, moist air, water vapor condenses into droplets of liquid water creating the fog. As the fog, which contains water droplets and gaseous carbon dioxide, passes through the soap film, bubbles form. Due to the relatively high density of the carbon dioxide bubbles, they fall rapidly.

**Hazards:** Dry ice is extremely cold and must be handled with care. Never seal dry ice in any container since the sublimation will build very high pressures.

**Reference:** *Twenty Demonstrations Guaranteed to Knock Your Socks Off!* by Bob Becker, Flinn Scientific Inc., P.O. Box 219 Batavia, IL 60510.

