Name_____
Date _____

Dry Ice Lab

Dry ice is the solid form of carbon dioxide gas. It is an interesting substance in that it sublimes, or changes directly from the solid to the gas phase. Since the liquid state is bypassed, dry ice does not melt. The solid magically seems to disappear as it changes to $CO_{2(g)}$.

Carbon dioxide is a very common substance. It is a byproduct of animal respiration. You exhale the very same type of molecules that are in dry ice! Another use for CO_2 is in the production of carbonated soda. The gas is bubbled through cold cola syrup under pressrure. Some of the gas dissolves and eventually is released, resulting in the fizziness that we enjoy when we consume a carbonated beverage.

Please use caution when using dry ice. The temperature of the solid is very low (-78°C). Dry ice absorbs heat from its surroundings. You will need to pick up the dry ice with a towel, tongs or forceps. *NEVER TOUCH DRY ICE WITH YOUR BARE HANDS*. Tissue damage or frostbite can result from the improper handling of dry ice.

Procedure:

1. Obtain a small piece of dry ice. Place it on the lab counter top. Observe.

What two states of matter are present? _____

2. Place the dry ice in a small cup. Tightly cover the beaker with the palm of your hand. What do you experience?

_____

Explain, in terms of molecular motion and kinetic energy, why gas molecules can exert the pressure that you feel beneath you hand.

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3. Place the dry ice on the countertop. Using tongs, push a coin vertically down into the ice.

Why does the coin vibrate? _____

Why does the icy frost form on the surface of the coin?

_____

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4. Obtain a piece of dry ice with a flat surface. Using a pencil, slide the block of dry ice across the lab bench. Attempt to have the block of ice come to rest as close as possible to the line taped down on the countertop.

Why does dry ice slide so easily?

Is the block of ice actually on the countertop or is it riding on a cushion of gas?

5. Using a pipet, make a small, quarter-sized puddle of water on the counter. Using tongs, place a tiny piece of dry ice in the puddle.

What do you observe?

6. *Teacher Demo:* Place several small pieces of dry ice into a clear plastic cup. Cover the cup with your hand to prevent the gas that forms from escaping. Pour the gaseous carbon dioxide over a lit candle.

What happens to the flame?

Based on your observations, is CO_2 lighter or denser than air?

7. Go to the station with the 20-L plastic tubs with dry ice.. Blow bubbles down into the container.

What do you observe? Why do you think this happened?