Name: _____ Physics 1 - Miguel Rocha Date: _____

Lab 11: Dry Ice Fun!

Purpose

To observe the sublimation of CO_2.

Introduction

We tend to think of carbon dioxide as a gas. It is odorless and invisible. It is a product of combustion and respiration. We breathe it out: trees breathe it in! It puts out fires and causes the greenhouse effect on Earth. But we only think of it as a gas because it is in the gaseous state at normal temperatures. If we remove enough heat, CO_2 can freeze into a solid substance that we know as "dry ice." If you have ever experienced dry ice, you know it is very cold. Unlike water which freezes at 0°C, CO_2 freezes at -77° C! Because of its low temperature, it can be DANGEROUS stuff!

WARNING!!! DO NOT touch the dry ice with your bare skin! It will instantly stick to you, freezing the water in your cells, giving you a very bad "burn!"

Dry ice is so called because it does not melt into liquid carbon dioxide before turning into gas. The process of a liquid changing state into gas is called evaporation. When a solid changes directly into gas, the process is called sublimation (the solid sublimes). Carbon dioxide needs higher than atmospheric pressures in order to form a liquid, thus when dry ice heats it turns into CO_2 gas directly skipping the liquid phase.

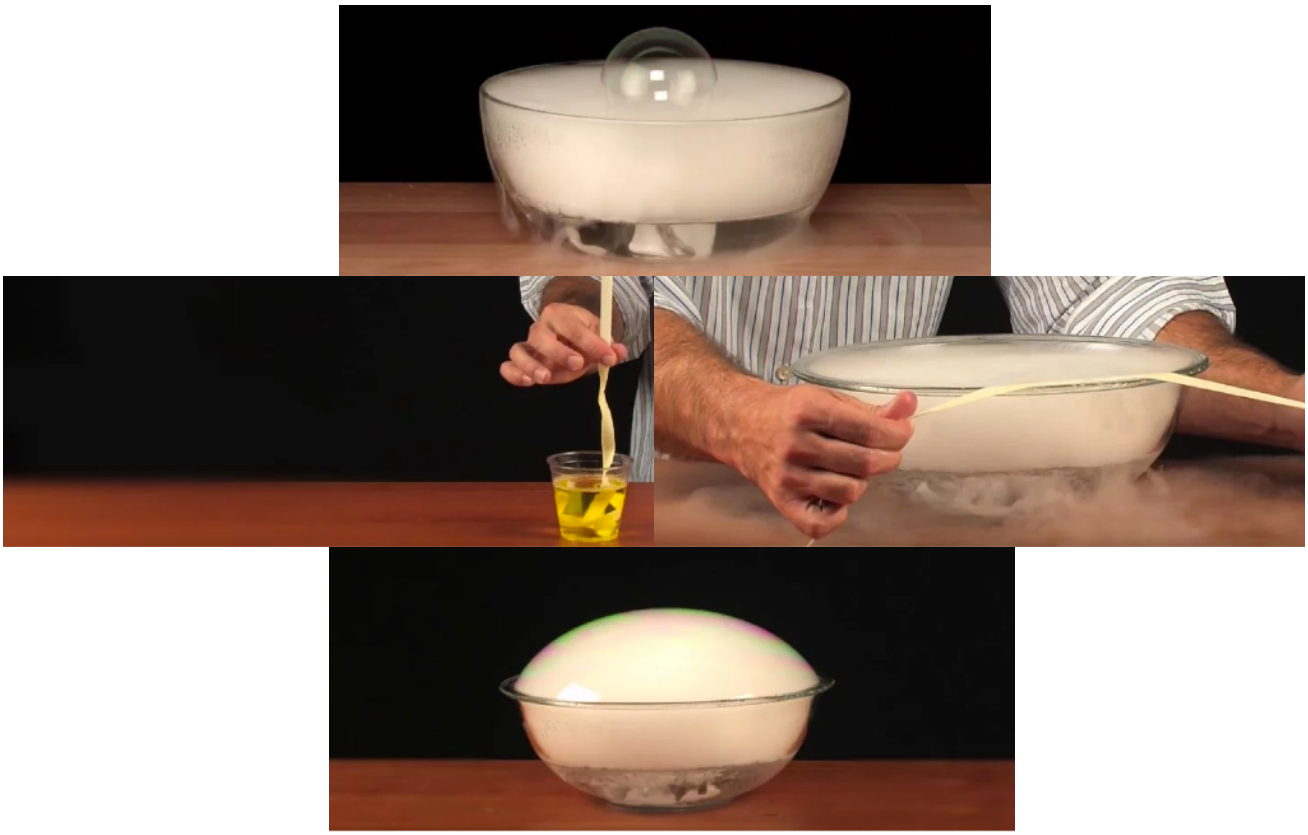
In this lab you will observe the sublimation process of dry ice by performing a set of playful experiments.

Procedure

REMEMBER: TOUCH AND MOVE THE DRY ICE WITH TONGS OR GlOVES ONLY!

1. **Surgical Glove/Balloon:** Have one of your group hold open a surgical glove/ balloon. Add fragments of dry ice. Then tie off the wrist of the glove/balloon. Set it aside on the lab table.

2. **In Water:** Put a chunk of dry ice into a wide container with warm water. To add a bit of fun try to drop some bubbles on the fog! Can you make a big bubble the width of the container that holds all the fog? If you feel brave to try that you can use a piece of fabric soaked with soapy water and sweep it across the opening of the container.



3. **With Soap:** This one works best in a skinny and tall container. Add some warm water and a squirt of dish soap to the container and put the container over a tray or another larger container (it will be messy otherwise), then add some dry ice.

Analysis

4. Complete the Lab 11 quiz on Canvas.