DRY ICE EXPERIMENTS

STUDENT WORKSHEET

OBJECTIVES

- 1. Understand the properties of Carbon dioxide as a solid and a gas
- 2. Understand and demonstrate the process of sublimation

PRECAUTIONS: Please read information sheet on precautions of handling dry ice.

EXPERIMENT 1: DRY ICE TURNING INTO A GAS

WHAT YOU NEED

- Styrofoam cup
- Chunk of dry ice
- Water
- Gladwrap
- Rubber band
- Candle
- Match

WHAT TO DO

- 1. Using metal tongs or appropriate material gloves to place a chunk of dry ice into the cup.
- 2. Place gladwrap over the top of the cup securing tightly with a rubber band.
- 3. Observe what happens.
- 4. Now take off the gladwrap for a moment and add ~ 2 tablespoons of water. If the gladwrap is broken use another piece of gladwrap.
- 5. Replace the gladwrap and tightly seal with the rubber band.
- 6. Observe what happens.
- 7. Now light the candle
- 8. Carefully pour the air from your cup onto the flame. Do not let any dry ice fall out.
- 9. Observe what happens.

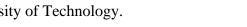
QUESTIONS

- 1. What happened to the gladwrap when you covered the cup with it?
- 2. Can you explain why this happened?
- 3. What happened when you added water to the cup?
- 4. Do you think dry ice is a good name for this material? Why/why not?

EXPERIMENT 2: FLOATING BUBBLES

WHAT YOU NEED

- Dry Ice
- Gloves, tongs
- Bubble solution and wand
- Ice cream container







DRY ICE EXPERIMENTS

WHAT TO DO

- 1. Using gloves and tongs, place some dry ice into a rectangular container.
- 2. Blow bubbles on top on the dry ice and observe what happens.

EXPERIMENT 3: BUBBLING OVER

WHAT YOU NEED

- Dry Ice
- Gloves, tongs
- Tall glass or plastic cylinder
- Liquid detergent 5-10mL
- Food colouring
- Warm water

WHAT TO DO

- 1. Fill the tall cylinder with warm water and add ~5-10mL of liquid detergent and your choice of food colouring.
- 2. Using gloves or tongs place pellets of dry ice into the plastic cylinder with the soapy water
- 3. Observe what happens.

QUESTIONS

1. Can you explain how the bubbles floated above the dry ice?

EXPERIMENT 4: SUPER COLD SOLUTION

WHAT YOU NEED

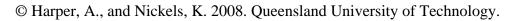
- Dry Ice
- Gloves, tongs
- Beaker or plastic cup
- Alcohol
- Water
- Flowers or leaves

WHAT TO DO

- 1. Fill the cup half way with alcohol.
- 2. Add 3 to 5 pellets of dry ice to the cup.
- 3. Using tongs hold the flowers or leaves in the cup for about 30 secs.
- 4. Remove the flower from the cup and observe what has happened.

QUESTIONS

- 1. What happened to the flower after you put it in the dry ice/alcohol mixture?
- 2. How do you think this happened?
- 3. What is the freezing point of water?
- 4. Why do you think you used alcohol instead of water to make this super cold solution?



REAL WORLD APPLICATIONS OF DRY ICE

Packaging: Dry ice is commonly used as packaging for items that need to remain cold or frozen, such as ice cream.

Medicine: In medicine it is used to freeze warts and sunspots to help remove them.

Construction industry: Used in the construction industry to loosen floor tiles by shrinking and cracking them, as well as to freeze water in valveless pipes to allow repair.

Fire extinguishers: Fire extinguishers use CO_2 to douse the flames of an electrical fire. The CO_2 "starves" the fire of its oxygen.

RESOURCES USED TO DEVELOP THIS ACTIVITY

- 1. Wikipedia Encyclopedea. (2008). *Dry Ice*. Retrieved October 30, 2008, from http://en.wikipedia.org/wiki/Dry_ice#Applications
- 2. *Dry Ice Info.com*. (2004). Retrieved October 30, 2008, from http://www.dryiceinfo.com/science.htm

Image courtesy of: Ice factory online. Retrieved October 30, 2008, from www.icefactoryonline.com.

