

OH WOW! Moment

Activity by Audra Carlson, Education Manager

Grade Level: All Ages. Adult supervision.

## **“Melting” Styrofoam Investigation**

### **AT A GLANCE:**

Kids can investigate the properties of an everyday polymer using household chemistry.

### **STUDENTS WILL BE ABLE TO:**

Demonstrate the process of science inquiry by posing questions and investigating phenomena through language, methods and instruments of science.

### **Warning**

*Acetone is a volatile and highly flammable chemical. All experiments should be performed in a well-ventilated area, preferably under an exhaust hood, if available. Wear protective eye wear at all times. Dissolving polystyrene releases a gas in the form of bubbles that may cause the acetone to splash. If you splash any acetone on your skin or in your eyes, rinse thoroughly with water.*

### **BACKGROUND INFORMATION:**

Students explore the effectiveness of acetone in reducing polystyrene for recycling. The students can measure how much polystyrene is dissolved by a particular volume of acetone.

### **PRINCIPALS:**

Styrofoam is the trademarked name of the plastic foam polystyrene. Polystyrene is not biodegradable and resists compression, making it a persistent part of landfill waste. When acetone and polystyrene are combined, the polystyrene appears to melt, but actually it only dissolves and releases the trapped air as it does so. For the investigatory project, students explore the effectiveness of acetone in reducing polystyrene for recycling. Students will measure how much polystyrene is dissolved by a particular volume of acetone.

### **MATERIALS:**

- 5 500ml glass beakers or several glass bowls
- 100% acetone nail polish or paint thinner
- Goggles
- Disposable gloves
- Smock or lab coat
- Measuring cups and spoons
- Pencil and paper for recording results

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### PROCEDURE:

1. Fill the five beakers with 10 ml, 20 ml, 50ml, 100 ml and 200 ml of acetone. You can also try 1 teaspoon, 2 teaspoons, 5 teaspoons,  $\frac{1}{2}$  cup and 1 cup of acetone.
2. Place a stack of five 6-oz. Styrofoam cups in each beaker or bowl and measure the amount of time it takes for the stack to dissolve.
3. Continue adding one cup at a time to the acetone until the acetone no longer dissolves the cups.
4. Repeat the experiment three to five times for each volume to get an average time and an average number of cups.

Try this:

- Try dissolving different types of Styrofoam. Is there a difference in the time or effectiveness of the acetone as a solvent?
- Stir in some glitter or a small amount of food coloring or paint to create colored plastic putty that you can use to sculpt your own masterpieces. They will harden as they dry.
- Note the volume of the acetone before and after the Styrofoam is added.

What do you notice or observe?

What conclusions can you make?

What can you do differently next time?

