California State University of Bakersfield, Department of Chemistry

The Can Crusher

Standards:

8th 3. d. & e. Students know the states of matter depend on molecular motion. 5. d. Students know physical processes include freezing and boiling, in which a material changes form with no chemical reaction.

Introduction:

This experiment will show students one example of differences in pressure in the environment. By heating aluminum cans and subjecting them to a colder environment, a vacuum effect will be created inside the can. This will instantly crush the can without having to touch it!

Materials:

- Several empty aluminum cans
- ½ Liter of cool water
- Hot plate (or other heat source which the cans can rest on)
- Shallow dish (such as a 9x13 baking dish)
- Tongs

Safety:

- Always have an adult with you to help you during your experiment.
- Always wear eye protection and gloves when doing chemistry experiments
- Conduct this experiment in a well-ventilated area.
- Be extremely careful with your heat source, you could be burned!

Procedure:

1. Prepare your heat source, and place the aluminum cans on it, with the opening facing up.
2. Add several mL's of water to the cans, and allow the water to heat up.
3. Prepare your shallow dish, and fill it with approximately 3/4 in. of cool water.
4. As the cans are heated, use your tongs to pick up the cans. Invert them, and submerge just the opening under the water.

Data and Observations:

Record your observations in this space:

What did you see? Anything you were not expecting? Describe it here.

Questions:

Why did the can seemingly crush itself after submerged in cold water, what forces are demonstrated here?

What do you think would happen if you submerge a cold can into hot water, would you see similar results?

References:

1. Spangler, S. Air Pressure Can Crusher. *Steve Spangler Science.* Web. July 19, 2012.