

Can Crusher Lab

Background: Condensation can occur when gas particles come near the surface of a liquid. The gas particles slow down because they are attracted to the liquid. This reduction in speed causes the gas particles to condense into a liquid. In this lab, you'll see that particles that have condensed into a liquid don't take up as much space and therefore don't exert as much pressure as they did in the gaseous state.

Safety Precautions: Wear your goggles at all times. Do not sit down during the lab.

Materials:

Water

1 empty aluminum can

hotplate

tongs

1 L beaker

Procedure:

1. Fill the container half of the way full with water.
2. Place 15 ml of water in an aluminum can to slightly cover the bottom.
3. Place the aluminum on the hot plate.
4. Heat the can until the water is boiling. Steam should be rising vigorously from the top of the can.
5. Using tongs, quickly pick up the can and place the top 2 cm of the can upside down in container filled with water.
6. Answer the questions below.

Analysis Questions

1. Describe your observations of the experiment.
2. What was the purpose the water that was added to the can and the flask?
3. Which takes up more space? . . . Water as a liquid, or water as vapor?
4. How do gases inside a container (can, tire, ball) actually cause "pressure"?
5. Why doesn't atmospheric pressure crush the can immediately after it is removed from the heat?
6. As the can was inverted into the cold water, what happened to the steam inside those containers?
7. Why did removing the can from the burner and inverting it in cold water cause a decrease in pressure inside?