ACTIVITY 15: FREEZING WATER

QUESTION

When ice melts, is the volume of water less than or greater than the volume of the ice?

SAFETY

Use only clean water for this activity. Do not work near electrical appliances or outlets. Clean up any spills immediately.

MATERIALS

Syringe, syringe cap, ice cube, water, pencil

PROCEDURE

In this lab, you will determining which is bigger, an ice cube or the water that results when the ice cube melts. You will do this by measuring the volume of a piece of ice, then letting the ice melt and measuring the volume of the water.

Get an ice cube that will fit inside your syringe. Cap the syringe and put 25 ml of water in it. Get all of the air bubbles out and check your measurement again. Put the ice cube in and push it down with a pencil or another thin object. Do not let the pencil go underwater, but make sure that the entire ice cube is under. Record the volume. Now let the ice cube melt and record the volume again.

Data

1. Volume of water _____ ml
2. Volume of ice and water _____ ml
3. Volume of ice _____ ml
4. Volume of melted ice and water _____ ml
5. Difference between #2 and #4 _____ ml

Post-Lab Questions

1. Was the water level higher before or after the ice melted?
2. Does this mean water expands or contracts when it freezes?
3. Use molecular geometry to explain why water expands or contracts when it freezes.
4. How does this explain why you should not put sealed containers (such as soda cans) in the freezer?
5. A) Assuming that the mass of the ice and water does not change during this experiment, which is more dense, ice or water?
   B) Support your answer with observations from your personal experiences.