

CAN CRUSHER LAB

Name: _____ Date: _____ Period: _____

Purpose: To observe the effects of rapid phase change, vaporization and condensation, on a soda can container.

I. **Ask a Question:** What will happen if you heat, then quickly cool a liquid in a soda can?

II. **Hypothesis:** If I heat, then quickly a liquid in a soda can, **then** _____

III. **Experiment:** *Materials:* Aluminum Soda Can, Bunsen burner, tongs, ice water bath, goggles

Procedure:

1. Rinse out an aluminum can and leave just enough water in the can to cover the bottom (a last sip).
2. Put on goggles, light Bunsen burner.
3. Heat the can over the Bunsen burner using tongs until water vapor (steam) is exiting the can.
4. Quickly flip the can upside down and submerge the opening into a bowl of cold water.

IV. **Analyze the Results:** Record the results of our experiment below. Please not the vocab below.

Vocab: Endo = Enter into

Exo = Exit out of

Thermic = Heat

1. As you heated the air and water inside the can, **a)** what was happening to the liquid water molecules? **b)** What phase change occurred within the water? **c)** Is this phase change “**endothermic**” (heat is entering) or “**exothermic**” (heat is exiting)? Explain.
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2. As you quickly cooled the water vapor inside the can, **a)** what was happening to the water vapor molecules? **b)** What phase change occurred? Is this phase change “**endothermic**” or “**exothermic**”?
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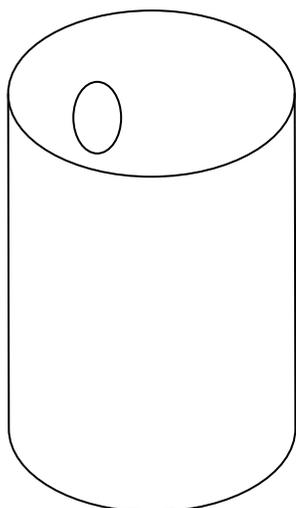
3. Describe what happened to the can and its gas contents.
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4. Did you crush the can with your tongs? No, the air outside the can crushed the can. **Explain** the chain reaction caused by the adding/removing of heat to/from the gases inside the can. _____
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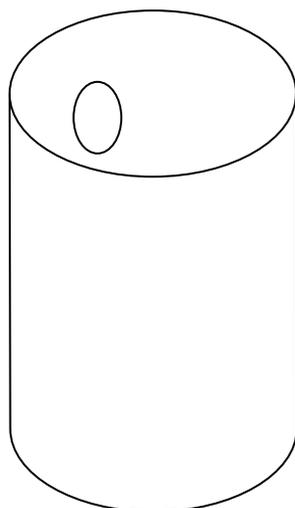
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5. In the 3 can drawings below, represent air and water molecules with **small circles** and **arrows** showing direction of their movement. Your drawing should represent the ratio of water and air molecules inside the can through each stage. Also, show the direction of air movement and relative number of molecules inside and outside the cans. In space above **D. Cooled Air/Water**, show the final condition of the can.

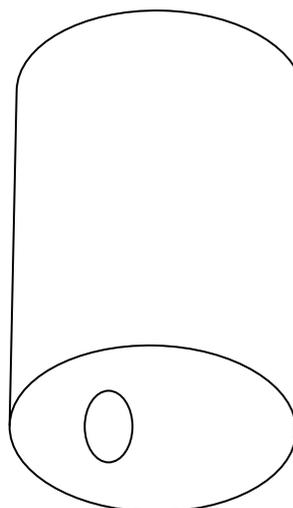
Key: ○ = _____ ○ = _____



A. Room Temperature
(Before)



B. Heating Air/Water
(While Heating)



C. Heated Air/Water
(After Boil, Before Crush)

D. Cooled Air/Water
(After cooled in ice water)

V. **Conclusion:** Answer the questions below.

1. Compare this experiment with the Air Lab: Candle, Test Tube, and Water experiment from the other day. How were the experiments the same? How were they different?

2. Inside a corn kernel is a small amount of water. Why does the corn explode when heated and not the can? Is this Corn Kernel “Pop” reaction “**endothermic**” or “**exothermic**”?
