

Heating Curve EXTRA Practice

Name: _____

Chemistry

Date: _____ Hour: _____

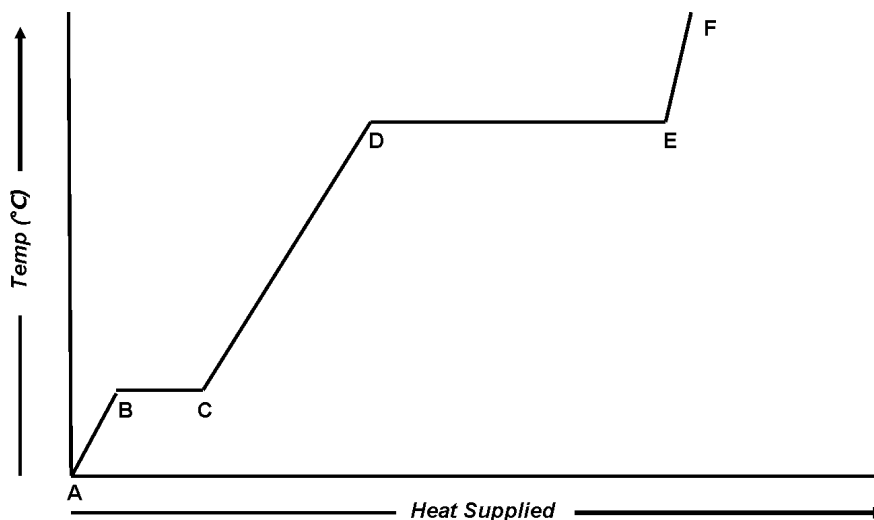
The organic compound acetone is a principal ingredient in most nail polish removers. Here are some of acetone's physical properties:

- molecular formula of $\text{C}_3\text{H}_6\text{O}$
- freezing point of -95.2°C
- $\Delta H_{\text{fus}} +5.72 \text{ kJ/mol}$
- $C_{\text{acetone}} = 1.00 \text{ J/g}\times^\circ\text{C}$
- boiling point of 56.4°C
- ΔH_{vap} is $+ 29.1 \text{ kJ/mol}$

Using the information above, answer the following questions regarding acetone's heating curve graph.

1) What temperature is acetone at when it is at location **B**?

2) What temperature is acetone at when it is at location **D**?



3) The temperature of acetone is not changing from location **B** to **C**, but heat is still being added. Explain.

4) What states(s) of matter exist between **A** and **B**? _____

5) What states(s) of matter exist between **D** and **E**? _____

6) When going from point B to C, what is the name/symbol of the enthalpy? _____

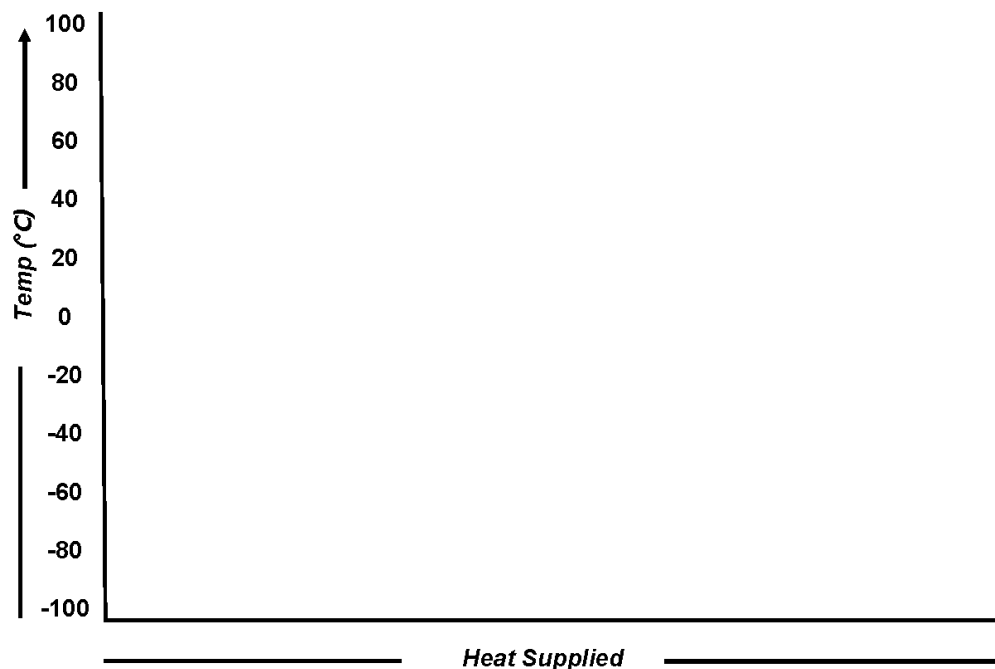
7) When going from point C to B, what is the name/symbol of the enthalpy? _____

8) When going from point D to E, what is the name/symbol of the enthalpy? _____

9) When going from point E to D, what is the name/symbol of the enthalpy? _____

10) Suppose you had 10.0 g of both liquid water and liquid acetone. Which would be easier to vaporize? The ΔH_{vap} for H_2O is 40.7 kJ/mol . Explain your reasoning.

11) Redraw acetone's heating curve graph by accurately representing its freezing and boiling points.



$$1 \text{ mol X} = \text{molar mass of X}$$

$$1000 \text{ J} = 1 \text{ kJ}$$

$$q = \text{mol} \Delta H_{\text{phasechange}}$$

$$q = mC\Delta T$$

12) Using the heating curve graph from #11, determine how much heat energy, in kJ, must be added to 20.0g of acetone at -100.0°C to raise its temperature to 100.0°C . Recall that $1 \text{ kJ} = 1000 \text{ J}$. A complete answer will show all work, proper units, and be rounded according to the rules of significant figures.