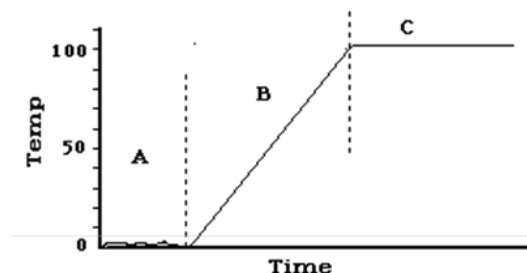


Chemistry – Unit 3 Work sheet

1. Part of the heating curve is shown above. It is divided into three regions:
- (A) a low temperature plateau
 - (B) a region of temperature change
 - (C) a high temperature plateau



For *each* region the graph,

- a. label how the energy supplied by the hotplate was stored by the system (E_{th} or E_{ph}).
- b. State what phases (states) were present at

A. _____

B. _____

C. _____

2. For *each* region on your above graph (A, B, C), draw a particle diagrams that shows how the water particles were behaving. Use whooshies to show increasing speed.



A.

B.

C.

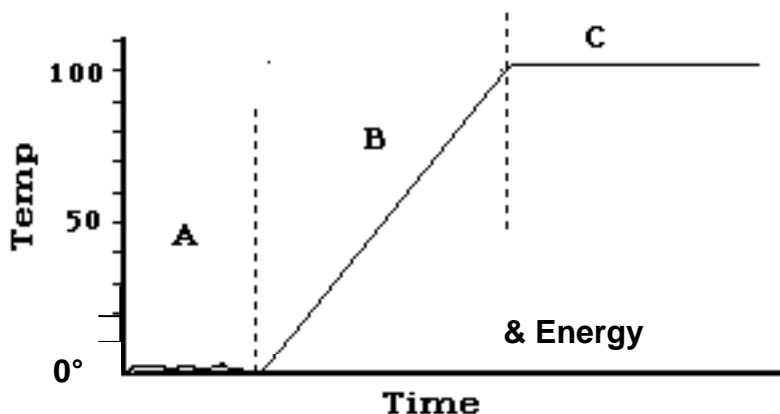
3. Use the graph below. Use the following choices to describe what is happening on the following labeled sections of the graph and answer the questions that follow the graph.

increasing (i)

decreasing (d)

the same (s)

zero (z)



- During region B the thermal energy \bar{E}_th is _____.
 - During region C the thermal energy is _____.
 - During region A the phase energy is _____.
- Did the system in this lab involve a chemical change or physical change? Explain.
 - Did the system absorb or release energy? Show which sections (A, B, C) of the curve were absorbing energy and which sections were releasing energy.
 - How would increasing the rate of heating by doubling the maximum heat of the hot plates affect the shape of the curve? Draw both curves (1x and 2x the maximum heat).



1x Maximum Heat

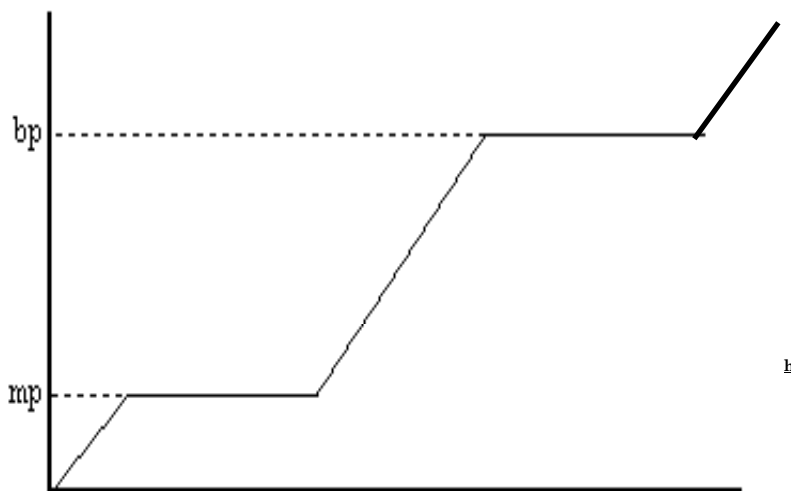


2x Maximum Heat

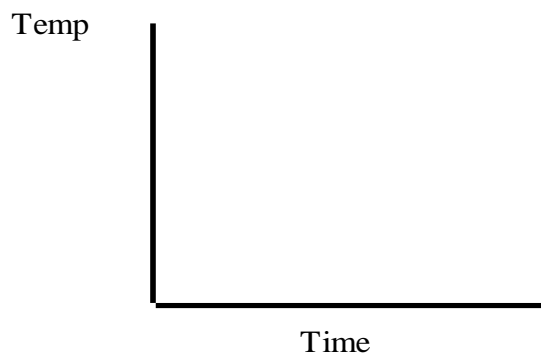
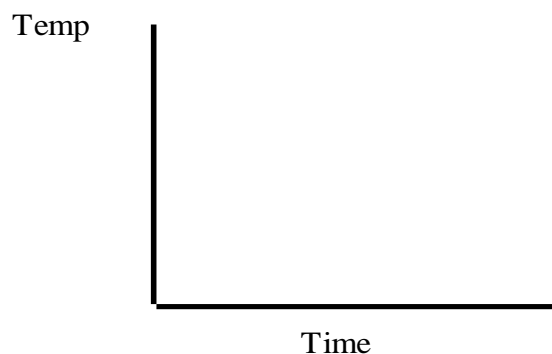
7. Kinetic Molecular Theory

This theory describes all matter as being composed of tiny particles in endless random motion.

When energy is transferred to a sample of matter, *either* the particles speed up (temperature increases) *or* they get pulled apart (phase change), but not both at the same time. This helps account for the shape of the warming curve you got in the Icy Hot lab.



- Label which phases are present in each portion of the curve above.
- Label the phase changes (Example: solid (s) \longrightarrow liquid (l)).
- Label the sections in which the thermal energy (E_th) of the sample is changing.
- Label the sections where the phase energy (E_ph) is changing.



8. On the **above left** graph, sketch the curve that describes the following:
- Initial state: 150 g solid water at -10°C
 - Final state: 150 g liquid water at 0°C
9. On the **above right** graph, sketch the curve that describes the following:
- Initial state: 200 g liquid water at 40°C
 - Final state: half of the water has boiled away at 100°C
10. On a counter is a glass of water with ice cubes floating in it. You measure the temperature and find it to be 0°C . Would the temperature of the water change if you were to add more ice cubes to the glass? Explain your answer.
11. How has the model changed? Note changes in the model we've introduced in this unit and the last unit (unit 2).