Name: Key Period:_____
Chemistry: Ch 13 Review

Multiple Choice.

B 1. A phase diagram gives information on:
a. volumes of gases.
b. temperature and pressure at which a substance exists as a solid, liquid, and gas.
c. volumes of liquids and solids.
d. mass changes of solids, liquids, and gases.

A 2. An increase in the temperature of a contained liquid:
a. causes the vapor pressure above the liquid to increase.
b. decreases the vapor pressure above a liquid.
c. causes fewer particles to escape the surface of the liquid.
d. has no effect on the kinetic energy of the liquid.

B 3. The direct change of a substance from a solid to a gas is called:
a. evaporation
b. sublimation.
c. condensation.
d. boiling.

C 4. The escape of gas molecules from the surface of an uncontained liquid is known as:
a. boiling.
b. sublimation.
c. evaporation.
d. condensation.

B 5. Condensation is the change in a substance from a
a. solid to liquid
b. gas to liquid
c. liquid to gas
d. liquid to solid

D 6. The conditions at which the solid, liquid, and gaseous phases of a substance can exist in equilibrium with one another is referred to as the:
a. boiling point.
b. freezing point.
c. sublimation point.
d. triple point.

Short Answer.

1. What does a phase diagram gives information about?

• temp + pressure at which a substance exists as a solid, liquid, or gas

2. An increase in the temperature of a contained liquid increases what?

• the vapor pressure above the liquid

3. The direct change of a substance from a solid to a gas is called sublimation.

4. The escape of gas molecules from the surface of an uncontained liquid is known as evaporation.

5. Condensation is the change in a substance from a gas to a liquid.

6. The conditions at which the liquid and gaseous phases of a substance are indistinguishable from one another is referred to as the critical pt.

7. How is the boiling point of water different on Mount Everest compared to Ohio? Explain the reason for this difference in boiling points.

- b.p. of H_2O on Mt Everest is lower than here in Ohio due to less atm pressure pressing down on the H_2O

8. Does the temperature of a substance vary while it is melting? Explain your answer.

- No. The heat that is being added is used to convert the substance from a solid to a liquid, but during that time, the temp does not change.

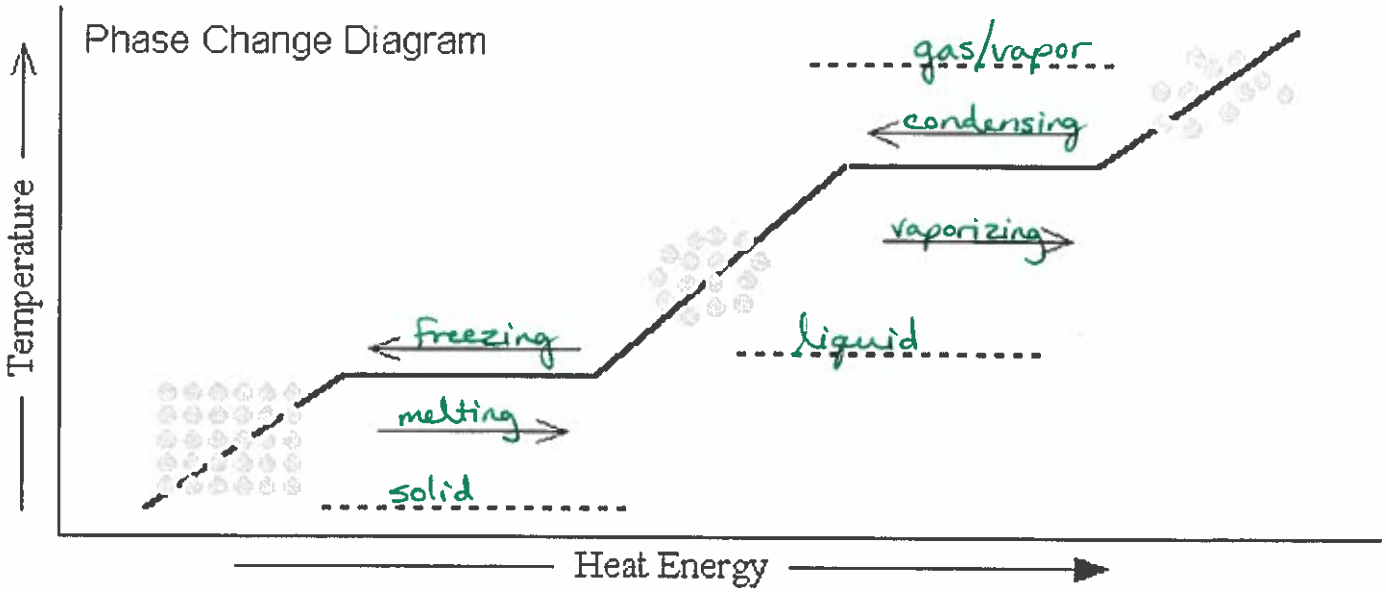
9. What happens to the vapor pressure of a liquid as the temperature increases? Explain.

- as temp ↑, the v.p. ↑ as well because more particles have enough KE to escape the surface of the substance

10. Explain triple point.

- The conditions of pressure + temp at which solid, liquid + gas all exist @ the same time.

11. Complete this phase change diagram. Write in the names of the phases (on the dotted line) and the phase change processes (on the small arrows). The little dots represent atoms or molecules of the substance.



12. Which of the phase changes in number 11 are exothermic?

condensing + freezing

13. Which of the phase changes in number 11 are endothermic?

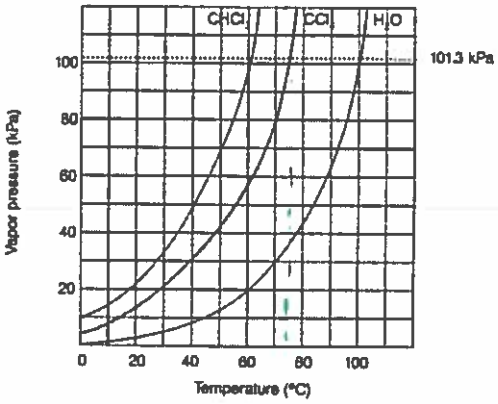
melting + vaporizing

PART B – VAPOR PRESSURE GRAPHS Use the graph below to answer the following questions.

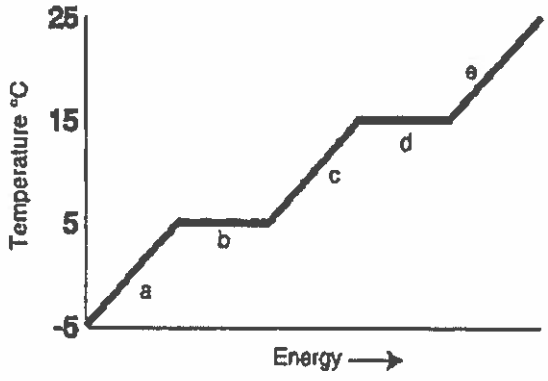
14. What is the vapor pressure of $CHCl_3$ at 50°C? 70kPa

15. What is the boiling point of H_2O when the external pressure is 30 kPa? 70°C

16. What is the normal boiling point of CCl_4? 75°C



PART C – HEATING CURVES. Use the heating curve below to answer the following questions.



17. What is the melting point of the substance? b

18. What is the boiling point of the substance? d

19. Which letter represents heating of the solid? a

20. Which letter represents heating of the vapor? e

21. Which letter represents melting of the solid? b

22. Which letter represents boiling of the liquid? d

PART D – PHASE DIAGRAMS. Use the phase diagram for water below to answer the following questions.

23. What is the state of water at 2 atm and 50°

liquid

24. What phase change will occur if the temperature is lowered from 80°C to -5°C at 1 atm?

freezing

25. You have ice at -10°C and 1 atm. What could you do in order to cause the ice to sublime?

lower the pressure to less than .0060 atm