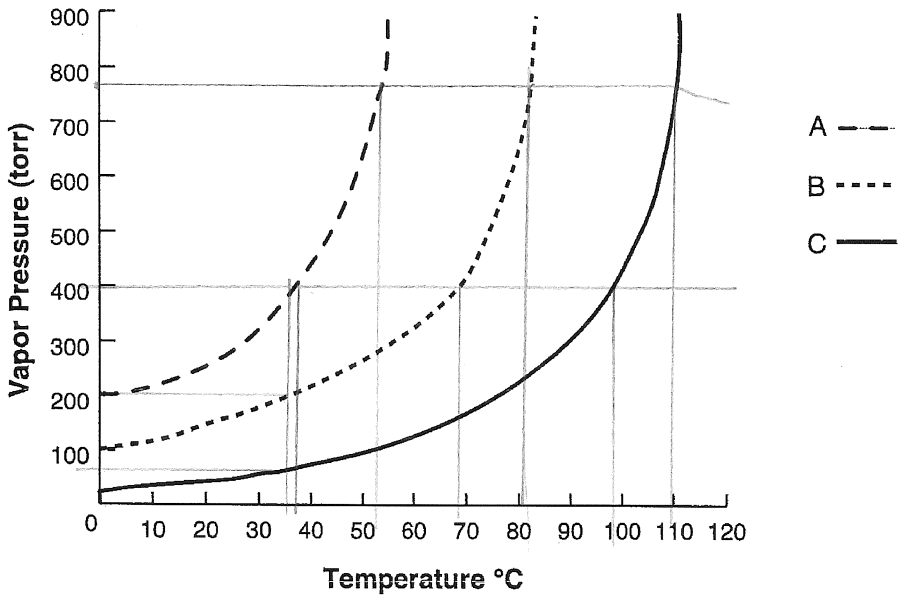
VAPOR PRESSURE AND BOILING

Name Key

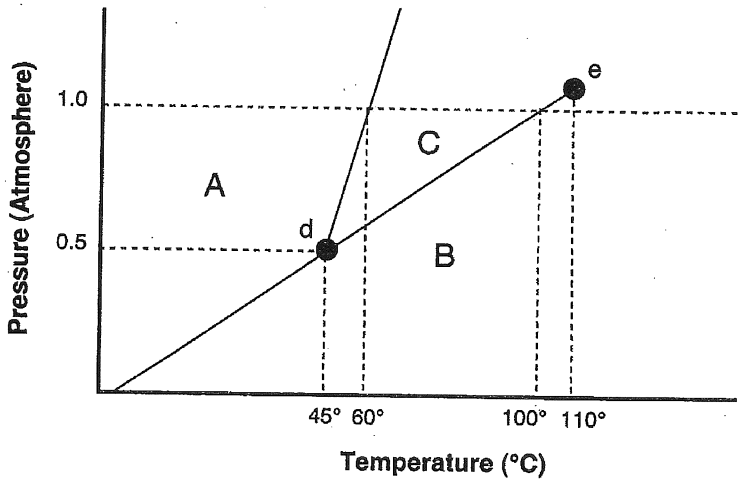
A liquid will boil when its vapor pressure equals atmospheric pressure. Answer the questions following the graph.



1. At what temperature would Liquid A boil at an atmospheric pressure of 400 torr? 38°C
2. Liquid B? 68°C
3. Liquid C? 98°C
4. How low must the atmospheric pressure be for Liquid A to boil at 35° C? ~400 torr
5. Liquid B? 200 torr
6. Liquid C? 65 torr
7. What is the normal boiling point of Liquid A? 53°C
8. Liquid B? 80°C
9. Liquid C? 110°C
10. Which liquid has the strongest intermolecular forces? C

PHASE DIAGRAM

Name Key



Answer the following questions using the chart above.

1. What section represents the solid phase? A
2. What section represents the liquid phase? C
3. What section represents the gas phase? B
4. What letter represents the triple point? d
5. What letter represents the critical point? e
6. What is this substance's normal melting point? 60°C
7. What is this substance's normal boiling point? 100°C
8. Above what temperature is it impossible to liquify this substance no matter what the pressure? 110°C
9. At what temperature and pressure do all three phases coexist? 45°C
10. Is the density of the solid greater than or less than the density of the liquid? Greater
11. Would an increase in pressure cause this substance to freeze or melt? freeze

Name _____ Date _____ Class _____

Chapter 17

TRANSPARENCY 37

PHASE DIAGRAM FOR WATER

1. In this phase diagram for water, what is being plotted on the x-axis and on the y-axis?

Temp on x Pressure on y

2. What does line AB represent? Explain in terms of equilibrium.

solid vapor line - solid and vapor can coexist together (equilibrium)

3. What does curve BD represent?

liquid vapor line - the T+P conditions where liquid and vapor exist (equilibrium)

4. What does line BC represent?

solid liquid - the T+P where liquid + vapor (gas)

5. What is point B called? Explain what is meant by the term.

Triple point - The T+P at which solid, liquid, and vapor can all exist

6. What is point D called? Explain what is meant by the term.

critical point - only gas can exist above

7. What is the temperature at the triple point? What is the pressure at the triple point?

.01°C, .611 kPa

8. What is the value of T_m, the normal melting point of ice?

0°C

9. What is the value of T_b, the normal boiling point of water?

100°C

10. What is the pressure 101.325 kPa equal to?

1 atm

11. Is the slope of the solid-liquid equilibrium line, BC, positive or negative? What unusual fact about water does this reflect?

negative - the solid is less dense than liquid