

NAME:

HONORS CHEMISTRY

SECTION:

Vapor Pressure Curves and Phase Diagrams

Part A – Vapor Pressure

- Denver is located exactly one mile above sea level, which means the normal atmospheric pressure is less than 1 atm. As a result, does water boil at a lower temperature or a higher temperature in Denver?

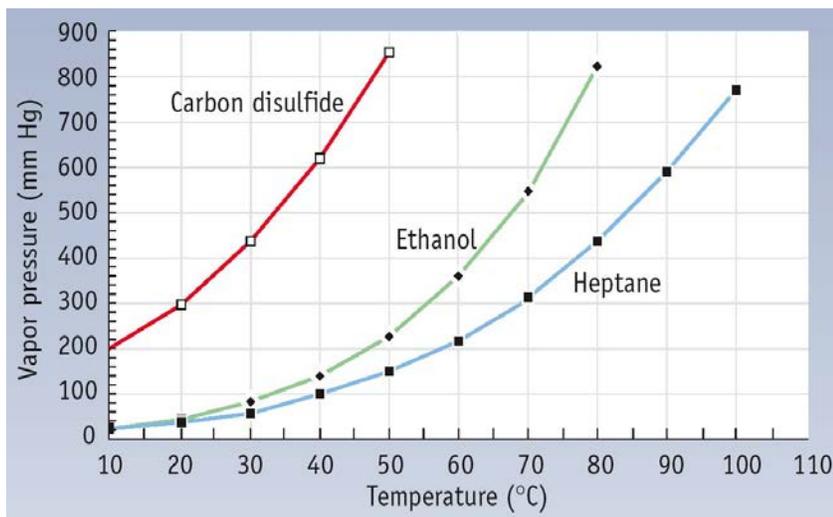
- Explain your response above.

3. Use the graph of vapor pressures vs. temperatures to respond to the questions below.

- What is the vapor pressure of carbon disulfide at 30°C? _____
- What is the boiling point of ethanol when the external pressure is 200 mm Hg? _____
- What is the normal boiling point of carbon disulfide? _____
- What is the vapor pressure of heptane at 70°C?

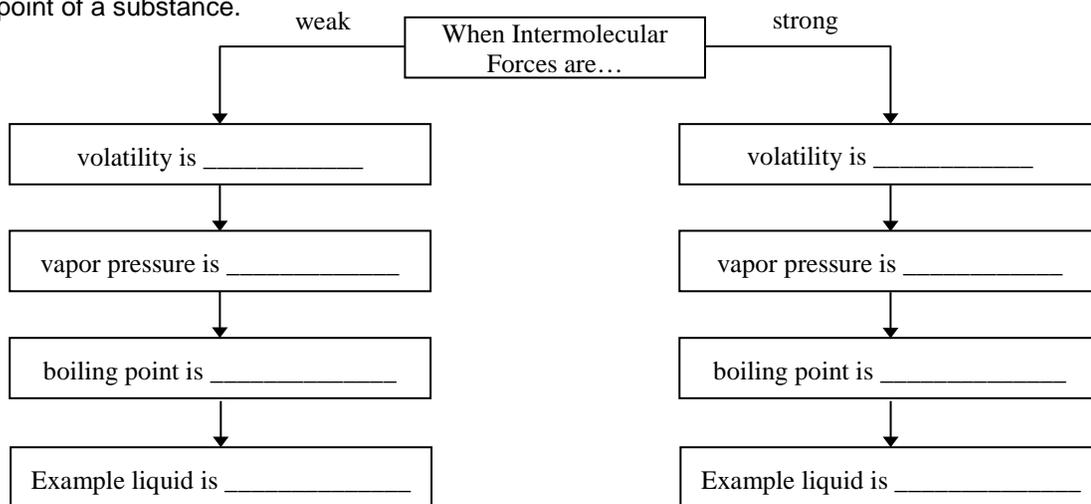
- What is the temperature if the vapor pressure of heptane is 450 mm Hg?

- Which substance in the graph has the weakest intermolecular forces? Explain!

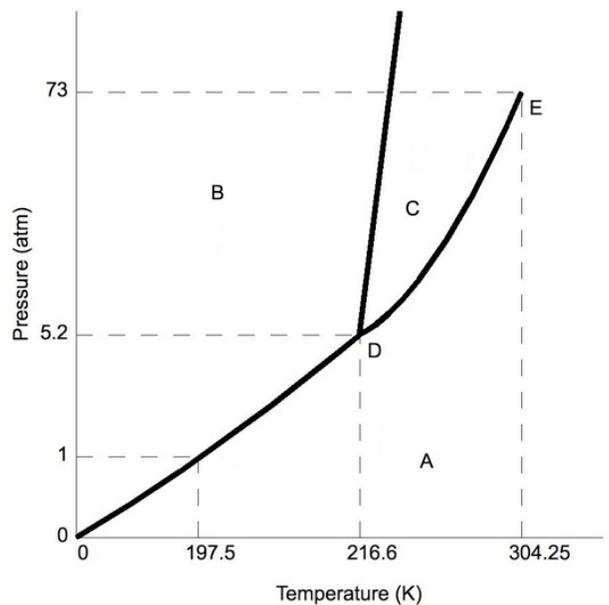


Part B – Intermolecular Forces

4. Fill in the diagram (with **high** or **low**) to show how intermolecular forces influence the volatility, vapor pressure, and boiling point of a substance.



Part C – Generic Phase Diagram. - Answer the questions below in relation to the following generic phase diagram.



5. Which section represents the solid phase? _____
6. What section represents the liquid phase? _____
7. What section represents the gas phase? _____
8. What letter represents the triple point? _____
In your own words, what is the definition of a triple point? _____
9. Remember that “normal” refers to normal pressure of 1 atm. What is this substance’s normal melting point? _____
10. What is this substance’s normal boiling point? _____
11. Above what temperature is it impossible to liquefy this substance, no matter what the pressure? _____
12. At what temperature and pressure do all three phases coexist? _____
13. At a constant temperature, what would you do to cause this substance to change from the liquid phase to the solid phase? _____
14. Under what conditions could this substance sublime? _____

Part D – Phase Diagram for Water

15. What is the normal freezing point of water? _____
16. What is the normal boiling point of water? _____
17. What is the critical temperature and pressure of water? _____ and _____
18. Use the capital letters (A,B,C, & D) to respond to the following:
 - a) Which line segment represents melting? _____
 - b) Which line segment represents deposition? _____
 - c) Which line segment represents evaporation? _____
 - d) Which line segment represents sublimation? _____
19. Identify the likely state of matter at each of the following conditions:
 - a) 80°C and 0.0008 atm: _____
 - b) 50°C and 100 atm: _____
 - c) -100°C and 1.0 atm: _____

