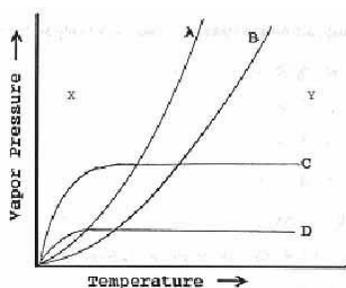


General Questions

1. What is the dominant intermolecular force in H_2 ?
 - a. London Dispersion (instantaneous dipole-induced dipole)
 - b. dipole-dipole
 - c. ion-dipole
 - d. hydrogen bonding
2. What is the major intermolecular force in H_2O ?
 - a. London Dispersion (induced dipole-induced dipole)
 - b. dipole-dipole
 - c. ion-dipole
 - d. hydrogen bonding
3. What is the major intermolecular force responsible for the dissolution of $NaCl$ in H_2O ?
 - a. London Dispersion (induced dipole-induced dipole)
 - b. dipole-dipole
 - c. ion-dipole
 - d. hydrogen bonding
4. Which force is strongest?
 - a. dipole/dipole
 - b. ion/dipole
 - c. London Dispersion
 - d. covalent
5. Hydrogen bonding is a special case of:
 - a. dipole-dipole forces
 - b. ion-dipole forces
 - c. covalent bonding
 - d. London Dispersion Forces
6. Which has the highest boiling point? (F_2 , Cl_2 , Br_2 , I_2)
7. Which has the highest boiling point? (HF , HCl , HI , HBr)
8. Which of the following molecules are not involved with hydrogen bonding?
 - a. H_2, NH_3
 - b. HI, HBr
 - c. HF, NH_3
 - d. $HCOOH, H_2O$
9. Which has the lowest boiling point? (He , Ne , Kr , Ar)
10. Which is more polarizable? (O , S , Se , Te)

Chapter 11: Intermolecular Forces and Liquids

- Placed the following compounds in the order of instantaneous dipole, dipole/dipole and hydrogen bonding as the primary intermolecular forces. (H_2O , H_2Se , CH_4)
- Arrange the following compounds in order of Increasing boiling points. (H_2O , H_2S , H_2Se , H_2Te)
- Arrange the following compounds in order of increasing boiling point. (H_2O , HF , NH_3 , CH_4)
- Which compound is the most polarizable? (I_2 , H_2 , F_2 , Br_2)
- Which species cannot be involved with hydrogen bonding? (HF , H_2O , NH_3 , NH_4^+)
- What intermolecular force is responsible for the dissolution of oxygen into water?
 - hydrogen bonding
 - instantaneous-induced dipole
 - dipole-induced dipole
 - dipole-dipole
- Which has the highest boiling point? (CH_4 , SiH_4 , GeH_4 , SnH_4)
- Which has the lowest boiling point? (CH_4 , SiH_4 , GeH_4 , SnH_4)
- Which has the highest boiling point? (NH_3 , PH_3 , CH_4 , SiH_4)
- What angle best approximates the geometric structure of ice? (90° , 109° , 120° , 180°)
- Which set of curves would represent the effect of increasing temperature on the vapor pressure of a liquid?



- A & B
 - C & D
 - All of them
 - None of them
- The normal boiling point is defined as:
 - 100°C
 - The boiling pt. at 1 atm
 - The boiling pt. on planet earth
 - None of the above
 - The normal boiling point of diethyl ether is 34.6°C and of water is 100°C . Which has the higher vapor pressure at 20°C ?
 - Water
 - diethyl ether
 - they are the same
 - it depends on your elevation

Chapter 11: Intermolecular Forces and Liquids

24. If one of the compounds in question 1 is diethyl ether and the other is water, curve___ is diethyl ether and curve___ is water.
- a. A,B
 - b. B,A
 - c. C,D
 - d. D,C
25. A liquid is _____ and assumes _____ of its container whereas a gas is _____ and assumes _____ of its container.
- a. Compressible, the volume and shape, condensed, the shape
 - b. Compressible, the volume, compressible, the volume and shape
 - c. Condensed, the volume and shape, condensed, the volume and shape
 - d. Not compressible, the shape of a portion, compressible, the volume and shape
 - e. Not compressible, the volume and shape, compressible, the shape
26. Choose the following molecule that exhibits dipole-dipole attractions? (AsH₃, BCl₃, Cl₂, CO₂, XeF₄)
27. What is the predominant intermolecular force in KBr?
- a. Dipole-dipole attraction
 - b. Hydrogen-bonding
 - c. Ionic bonding
 - d. London-dispersion forces
28. What is the principal difference in the normal boiling points of ICl (97C; molecular mass 162 amu) and Br₂ (59C; molecular mass 160 amu)?
- a. Both dipole-dipole interactions and London-dispersion forces
 - b. Both hydrogen-bonding and dipole-dipole interactions
 - c. Dipole-dipole interactions
 - d. Hydrogen bonding
 - e. London-dispersion forces
29. Explain the reason why iodine is a solid, bromine is a liquid, and chlorine is a gas at room temperature.
30. The _____ is the attractive force between an instantaneous dipole and an induced dipole.
- a. Dipole-dipole attraction
 - b. Hydrogen-bonding
 - c. Ion-dipole attraction
 - d. Ionic bonding
 - e. London dispersion forces
31. Choose the ethane molecule that has the highest boiling point.
- a. C₂Br₆
 - b. C₂Cl₆
 - c. C₂F₆
 - d. C₂H₆
 - e. C₂I₆

Chapter 11: Intermolecular Forces and Liquids

32. What is the major attractive force that exists among different I_2 (elemental iodine, I_2 , is a solid at room temperature) molecules in the solid?
- Covalent-ionic interactions
 - Dipole-dipole attractions
 - Dipole-dipole rejections
 - Ionic-dipole interactions
 - London dispersion forces
33. Hydrogen bonding is a special case of what other intermolecular forces?
- Dipole-dipole attractions
 - Ion-dipole attraction
 - Ion-ion interactions
 - London-dispersion forces
 - None of these
34. Which of the following has the highest boiling point? (N_2 , Br_2 , H_2 , Cl_2 , O_2)
35. The molecules in $C_{12}H_{26}$ are held together by ____.
- Dipole-dipole interactions
 - Dispersion forces
 - Hydrogen bonding
 - Ion-dipole interactions
 - Ion-ion interactions
36. The shape of a liquid's meniscus is determined by ____.
- the relative magnitudes of cohesive forces in the liquid and adhesive forces between the liquid and its container
 - the type of material the container is made of
 - the viscosity of the liquid
 - the volume of the liquid
37. Viscosity is ____.
- Inversely proportional to molar mass
 - The "skin" on a liquid surface caused by intermolecular attraction
 - The resistance to flow
 - The same as density
 - Unaffected by temperature
38. What property is responsible for the "beading up" of water?
- density
 - hydrogen bonding
 - surface tension
 - vapor pressure
 - viscosity

Chapter 11: Intermolecular Forces and Liquids

39. Explain which substance in each of the following pairs is likely to have the higher normal melting point: (a) HCl or NaCl; (b) $\text{C}_2\text{H}_5\text{OC}_2\text{H}_5$ (diethyl ether) or $\text{C}_4\text{H}_9\text{OH}$ (butanol); (c) CHI_3 or CHF_3 ; (d) C_2H_4 or CH_3OH
40. Explain which substance in each of the following pairs is likely to have the higher normal melting point: (a) H_2S or H_2O ; (b) NH_3 or PH_3 ; (c) KBr or CH_3Br ; (d) CH_4 or SiH_4 .
41. Predict the shapes of each of the following molecules and identify the member of each pair with the higher boiling point using VESPR models: (a) PBr_3 or PF_3 ; (b) SO_2 or CO_2 ; (c) BF_3 or BCl_3 .
42. Determine which liquid in each of the following pairs has the greater surface tension: (a) cis-dichloroethene or trans-dichloroethene; (b) benzene at 20°C or benzene at 60°C .
43. Rank the following molecules in order of increasing viscosity at 50°C : $\text{C}_6\text{H}_5\text{SH}$, $\text{C}_6\text{H}_5\text{OH}$, C_6H_6 .
44. The boiling point of chloroform (CHCl_3) is lower than that of carbon tetrachloride (CCl_4). Since chloroform is polar and carbon tetrachloride is not, with consideration of the dipole-dipole forces would predict that chloroform would have the higher boiling point. How can we account for the observed order of the boiling points?