

Ch 11-12 MC Review

- Helium atoms do not combine to form He_2 molecules, yet He atoms do attract one another weakly through
 - dipole-dipole forces.
 - ion-dipole forces.
 - dispersion forces.
 - dipole-induced dipole forces.
 - hydrogen bonding.
- The molecular property related to the ease with which the electron density in a neutral atom or molecule can be distorted is called
 - a dipole moment.
 - polarizability.
 - a dispersion force.
 - surface tension.
 - a van der Waals force.
- Which two properties are more typical of molecular compounds than of ionic compounds?
 - They are gases or liquids at room temperature.
 - They have high melting points.
 - Solids do not conduct electricity, but liquids do.
 - Atoms share electrons.

A. I and IV	B. I and III
C. II and III	D. II and IV
E. III and IV	
- Which of the following substances should have the highest boiling point?

A. CH_4	B. Cl_2	C. Kr
D. CH_3Cl	E. N_2	
- Which of the following properties indicates the presence of *strong* intermolecular forces in a liquid?
 - a low heat of vaporization
 - a low critical temperature
 - a low vapor pressure
 - a low boiling point
 - none of these
- For which of the following species are the intermolecular interactions entirely due to dispersion forces?

A. C_2H_6	B. CH_3OCH_3	C. NO_2
D. H_2S	E. CaNO_3	
- Each of the following substances is a liquid at -50°C . Place these liquids in order of *increasing* vapor pressure. dimethyl ether (CH_3OCH_3), propane (C_3H_8), ethanol ($\text{CH}_3\text{CH}_2\text{OH}$)
 - ethanol < propane < dimethyl ether
 - ethanol < dimethyl ether < propane
 - propane < dimethyl ether < ethanol
 - dimethyl ether < ethanol < propane
 - propane < ethanol < dimethyl ether
- Given the following liquids and their boiling points, which has the *highest* vapor pressure at its normal boiling point?
 - ethanol, bp = 78°C
 - methanol, bp = 65°C
 - water, bp = 100°C
 - benzene, bp = 80°C
 - The vapor pressure of each of the liquids at its normal boiling point would be the same.
- Krypton has a *higher* melting point than argon because of its
 - hydrogen bonding.
 - stronger dispersion forces.
 - permanent dipole moment.
 - ionic bonds.
 - greater ionization energy.
- Which of the responses includes all of the following that can form hydrogen bonds with water molecules?

(1) Na^+	(2) CH_3COOH
(3) C_2H_6	(4) CH_3NH_2

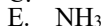
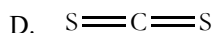
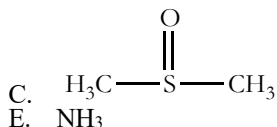
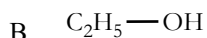
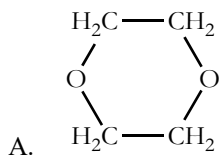
A. (1) and (2)	B. (1) and (3)
C. (2) and (3)	D. (2) and (4)
E. (3) and (4)	
- Which property of water allows a razor blade to float on it without sinking?

A. viscosity	B. surface tension
C. density	D. specific heat
E. triple point	
- The structural form of the element Ge closely resembles the structure of

A. C (diamond).	B. N (diatomic).
C. As (tetrahedral).	D. S (S_8 ring).
E. Kr (monatomic).	
- Which of the following is *not* an endothermic process?
 - melting of a solid
 - vaporization
 - raising the temperature of a gas
 - condensation of water vapor
 - sublimation of dry ice
- Solid iodine has a vapor pressure of 1.0 mmHg at 39°C . How many *moles* of iodine will sublime into a 500. mL flask at this temperature? If the volume of the flask is doubled at constant temperature, what will happen to the *equilibrium* vapor pressure of I_2 ? (Assume some solid I_2 is always present in the container.)
 - 2.1×10^{-4} mol; vapor pressure increases
 - 2.0×10^{-2} mol; vapor pressure increases
 - 2.6×10^{-5} mol; no change in vapor pressure
 - 2.1×10^{-4} mol; no change in vapor pressure
 - 2.6×10^{-5} mol; vapor pressure decreases

15. The molar heats of sublimation and fusion of iodine are 62.3 kJ/mol and 15.3 kJ/mol, respectively. Calculate the molar heat of vaporization of liquid iodine.
- A. 77.6 kJ/mol B. 47.0 kJ/mol
 C. -47.0 kJ/mol D. -77.6 kJ/mol
 E. 4.07 kJ/mol

16. Which one of the following would be immiscible with water?



17. The solubility of nitrogen gas at 25°C and a nitrogen pressure of 522 mmHg is 4.7×10^{-4} mol/L. What is the value of the Henry's Law constant in mol/L·atm?

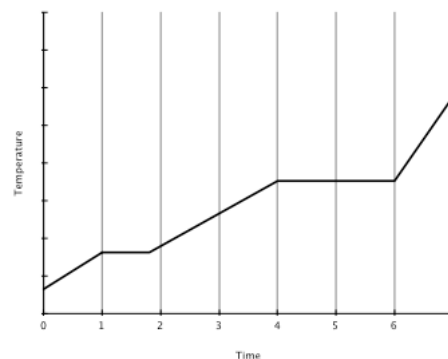
- A. 6.8×10^{-4} mol/L·atm
 B. 4.7×10^{-4} mol/L·atm
 C. 3.2×10^{-4} mol/L·atm
 D. 9.0×10^{-7} mol/L·atm
 E. 1.5×10^3 mol/L·atm

18. The solubility of oxygen in lakes high in the Rocky Mountains is affected by the altitude. If the solubility of O_2 from the air is 2.67×10^{-4} M at sea level and 25°C, what is the solubility of O_2 at an elevation of 12,000 ft where the atmospheric pressure is 0.657 atm? Assume the temperature is 25°C, and that the mole fraction of O_2 in air is 0.209 at both 12,000 ft and at sea level.

- A. 1.75×10^{-4} M B. 2.67×10^{-4} M
 C. 3.66×10^{-5} M D. 4.06×10^{-4} M
 E. none of these

19. Which of the following correctly describes the conductivity observed by doping Si with the indicated element?

- A. Ge; n-type B. Ge; p-type
 C. P; p-type D. As; n-type
 E. Ga; n-type



20. The heating curve above gives the relationship between time and temperature as a sample of an unknown substance goes through phase changes. The sample begins as a solid and is heated at a constant rate. At which point is the sample half liquid and half gas?

- A. Time 3 B. Time 4
 C. Time 5 D. Time 6
 E. Time 7