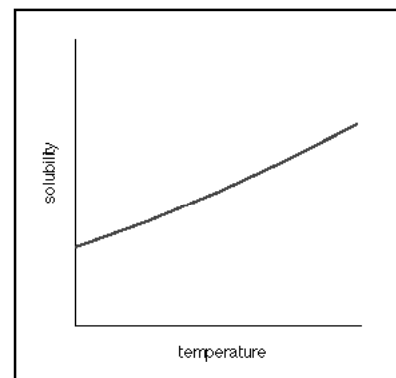


Solution Chemistry Problem Set

- Which of the following is not a solution?
 - 14 carat gold
 - coca cola
 - foggy air
 - all are solutions
- The number of gram molecular weights per liter of solution is called the:
 - molality
 - normality
 - formality
 - molarity
- Which of the following is true regarding an equilibrium system consisting of a solution and another phase in which one of the solution components is in the form of a pure substance:
 - the substance has low solubility
 - the solution is called a crystalline solution
 - the solution is saturated
 - more than one of the above
- In which of the following would dodecane be most completely dissolved?
 - water
 - isopropyl alcohol
 - gasoline
 - isopropyl ether
- That the solubility of a gas in a liquid is proportional to the partial pressure of the gas is a statement of:
 - Henry's law
 - Dalton's law of partial pressures
 - Raoult's law
 - Boyle's law
- The graph of at right is a representation of the solubility vs. temperature of substance A.
 - The enthalpy of solution for substance A is negative
 - The enthalpy of solution for substance A is positive
 - Dissolving substance A is an exothermic process
 - Both b and c are correct



7. The molal freezing point depression constant K_f of water is $1.86\text{ }^{\circ}\text{C}/m$, when a 0.1 molal solution of KBr was tested, the freezing point depression was found to be $0.35\text{ }^{\circ}\text{C}$. Which of the following help to explain the observed value of the freezing point depression?
- In this solution, KBr creates 2 moles of ions per mole of solute dissolved.
 - The van't Hoff factor for KBr at this concentration in water of this temperature is 2.
 - The degree of ionization is 88%.
 - All of the above
8. Which of the following illustrate LeChatelier's principle?
- When the enthalpy of solution is positive, solubility increases with increasing temperature.
 - The common ion effect
 - Addition of strong base to a solution containing a dissolved salt whose cation is NH_4^+ increases the solubility of the salt.
- I
 - I and III
 - II and III
 - I, II, and III
9. The K_{sp} of $\text{Pb}(\text{OH})_2 = 1.0 \times 10^{-16}$, while the K_{sp} of PbSO_4 is 2.0×10^{-8} .
- Lead hydroxide is more stable in water than lead sulfate.
 - Lead sulfate is more stable in water than lead hydroxide.
 - Lead sulfate would precipitate if equal amounts of saturated solutions of lead sulfate and lead hydroxide were mixed.
 - Both b and c are correct.
10. Assuming total dissociation of CaCl_2 , which of the following occurs when .5 liter of $2 \times 10^{-5}\text{ M}$ CaCl_2 solution is added to a .5 liter solution that is saturated with CaCO_3 ($K_{sp} = 4.9 \times 10^{-9}$)?
- no precipitation
 - precipitation of CaCO_3
 - formation of supersaturated solution
 - possibly more than one of the above
11. After a stream of air was bubbled through a 150 g solution of diethyl ether ($\text{C}_4\text{H}_{10}\text{O}$), the mass of the ether was found to have decreased by 10 g. Then, 9 g of an unknown, non-volatile substance was then dissolved in 150 g of ether and a stream of air was bubbled through the solution. After the process, the mass of the solution was found to have decreased by 9.5 g. What is the molecular weight of the unknown compound?
- 110 g
 - 45 g
 - 70 g
 - 90 g