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**Max Time : 1 hr** **Class : 12th Chemistry Max Marks : 30**

**Unit Test**

1. Why do gases always tend to be less soluble in liquid as the temperature is raised ? **[ 2 ]**
2. Explain : a) Molarity b) Molality **[ 2 ]**
3. Explain Raoult’s Law for Volatile solute. **[ 2 ]**
4. The concentration of H2SO4 in a bottle labelled “conc. Sulphuric acid” is 18 M. The solution has a density of 1.84 g/cm3. What is the mole fraction and weight percentage of H2SO4 in this solution ?

**[ 3 ]**

1. A 100 cm3 solution of sodium carbonate is prepared by dissolving 8.653 g of the salt in water. The density of solution is 1.0816 g per millilitre. What are the molarity and molality of the solution. **[ 3 ]**
2. An aqueous solution of a dibasic acid (molar mass = 118) containing 35.4 g of the acid per litre of the solution has density 1.0077 g/cm3. Express the concentration of the solution in as many ways as you can. **[ 3 ]**
3. A sugar syrup of weight 214.2 g contains 34.2 g of sugar (C12H22O11). Calculate (i) molal concentration (ii) mole fraction of sugar in a syrup. **[ 3 ]**
4. The density of a 3M Na2S2O3 (sodium thiosulphate) solution is 1.25 g/cm3. Calculate (i) percentage by weight of sodium thiosulphate (ii) the mole fraction of sodium thiosulphate (iii) the molality of Na+ and ions. **[ 3 ]**
5. Air contains O2 and N2 in the ratio of 1 : 4. Calculate the ratio of solubilities in terms of mole fractions of O2 and N2 dissolved in water at atmospheric pressure and room temperature at which Henry’s constant for O2 and N2 are 3.30 x 107 torr and 6.60 x 107 torr respectively. **[ 3 ]**
6. Henry’s law constant for CO2 in water is 1.67 x 108 Pa at 298 K. Calculate the quantity of CO2 in 500 mL of soda water when packed under 2.5 atm CO2 pressure at 298 K. **[ 3 ]**
7. At what partial pressure, oxygen will have a solubility of 0.05 g/L in water at 293 K? Henry’s constant (KH) for O2 in water at 293 K is 34.86 K bar. Assume the density of the solution to be same as that of the solvent. **[ 3 ]**