****

**CHEMISTRY**

1. Calculate the molality and mole fraction of the solute in aqueous solution containing 3.0g of urea (molar mass = 60g/mol) per 250 g of water.

2. A solution contains 90g of water, 6.4g of methanol and 18.4 g of glycerol. What is the mole fraction of glycerol?

3. Calculate the molality of 1 litre solution of 93% sulphuric acid solution. The density of the solution is 1.84 g/mL

4. Calculate the number of moles of methanol in 5 L of its 2 m solution, if the density of the solution is 0.981kg/L ( molar mass of methanol = 32 g/mol

5. A 6.90 M solution of KOH in water contains 30% by mass of KOH. Calculate the density of the KOH solution ( molar mass of KOH= 56 g/mol)

6. A 5.2 molal aqueous solution of methyl alcohol, is supplied. What is the mole fraction of methyl alcohol in solution?

7. Calculate the molarity of a solution of CaCl2 if on chemical analysis it is found that 200 mL of CaCl2 solution contains 3.01 x 1022 chloride ions.

8. Calculate the amount of benzoic acid required for preparing 250 mL of 0.15 M solution in methanol.

9. Henry’s Law constant for the molality of methane in benzene at 298K is 4.27x105 mm Hg. Calculate the solubility of methane in benzene at 298 K under 760 mm Hg.

10. A solution is obtained by mixing 300g of 25% and 400 g of 40% solution by mass. Calculate the mass percentage of the resulting solution.

11. At what partial pressure , oxygen will have a solubility of 0.05 g/L in water at 298 K? Henry’s constant for O2 in water at 298 K is 34.86 k bar. Assume the density of the solution to be same as that of the solvent.

12. Concentrated nitric acid used in the laboratory is 68% nitric acid by mass in aqueous solution. What should be the molarity of such a sample of the acid if the density of the solution is 1.054 g/mL.

1. Calculate the molality and mole fraction of the solute in aqueous solution containing 3.0g of urea (molar mass = 60g/mol) per 250 g of water.

**Solution:**

2. A solution contains 90g of water, 6.4g of methanol and 18.4 g of glycerol. What is the mole fraction of glycerol?

**Solution:**

Mole fraction of glycerol = n

3. Calculate the molality of 1 litre solution of 93% sulphuric acid solution. The density of the solution is 1.84 g/mL

**Solution:**

4. Calculate the number of moles of methanol in 5 L of its 2 m solution, if the density of the solution is 0.981kg/L ( molar mass of methanol = 32 g/mol)

**Solution:**

5. A 6.90 M solution of KOH in water contains 30% by mass of KOH. Calculate the density of the KOH solution ( molar mass of KOH= 56 g/mol)

**Solution**

6. A 5.2 molal aqueous solution of methyl alcohol, is supplied. What is the mole fraction of methyl alcohol in solution?

**Solution**

7. Calculate the molarity of a solution of CaCl2 if on chemical analysis it is found that 200 mL of CaCl2 solution contains 3.01 x 1022 chloride ions.

**Solution**

8. Calculate the amount of benzoic acid required for preparing 250 mL of 0.15 M solution in methanol.

**Solution**

9. Henry’s Law constant for the molality of methane in benzene at 298K is 4.27x105 mm Hg. Calculate the solubility of methane in benzene at 298 K under 760 mm Hg.

**Solution**

10. A solution is obtained by mixing 300g of 25% and 400 g of 40% solution by mass. Calculate the mass percentage of the resulting solution.

**Solution**

11. At what partial pressure , oxygen will have a solubility of 0.05 g/L in water at 298 K? Henry’s constant for O2 in water at 298 K is 34.86 k bar. Assume the density of the solution to be same as that of the solvent.

**Solution**

12. Concentrated nitric acid used in the laboratory is 68% nitric acid by mass in aqueous solution. What should be the molarity of such a sample of the acid if the density of the solution is 1.054 g/mL.

**Solution**