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| **Karan Arora** **R.L. Chemistry Classes M: 99968-68554**  **Class : XI**  **“SOME BASIC CONCEPTS OF CHEMISTRY”** |

**Objective Assignment – 1**

1. Which of the following is correct?
2. The sum of mole fractions of all the components in a solution is always unity.
3. Mole fraction depends upon temperature.
4. Mole fraction is always negative.
5. Mole fraction is independent of content of solute in solution.
6. Which of the following methods of expressing concentration varies with temperature?

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| a) Molality | b) weight percent | c) Molarity | d) Mole fraction |

1. What is the molarity of NaOH solution if 250 mL of it contains 1 mg of NaOH?

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| a) 10 – 1 M | b) 10 – 2 M | c) 10 – 4 M | d) 10 – 3 M |

1. How many moles of sodium chloride present in 250 mL of a 0.5 M NaCl solution?

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| a) 0.125 mol | b) 0.150 mol | c) 0.075 mol | d) 0.02 mol |

1. A 5 M solution of H2SO4 is diluted from 1 litre to a volume of 100 litres, the normality of the solution will be :

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| a) 1 N | b) 5 N | c) 0.1 N | d) 0.5 N |

1. 12 g Mg (At. mass = 24) react with dilute mineral acid t produce maximum hydrogen equal to:

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| a) 0.5 mol | b) 1.5 mol | c) 1.5 g | d) 0.5 g |

1. Number of atoms present in 120 a.m.u. of calcium is :

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| a) 3 NA | b) 6 NA | c) 3 | d) 6 |

1. How many moles of Aluminium sulphate, Al2(SO4)3 will contain 0.24 mole of oxygen atoms?

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| a) 2.0 x 102 | b) 2.0 x 10 – 2 | c) 3.0 x 103 | d) 1.5 x 10 – 2 |

1. Which of the following molecules has highest percentage of oxygen by mass?

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| a) H2O | b) CO2 | c) CaCO3 | d) C2H5OH |

1. How many moles of ethane are required to produce 44 g of CO2 (g), after the combustion of ethane?

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| a) 2 | b) 1 | c) 0.5 | d) 0.25 |

1. What is the mass of Sodium acetate (CH3COONa) required to make 200 mL of 0.245 molar aqueous solution? (Molar mass of CH3COONa = 82 g/mol).

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| --- | --- | --- | --- |
| a) 3 g | b) 4 g | c) 5 g | d) 6 g |

1. Molarity of 29 % (W/W) H2SO4, solution whose density is 1.22 g/mL, is:

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| --- | --- | --- | --- |
| a) 1.8 M | b) 3.6 M | c) 2.4 M | d) 1.2 M |

1. In a reaction 3A + B2 A3B2. If 180 atoms of ‘A’ and 100 molecules of ‘B’ react, then:
2. ‘B’ is limiting reactant and 100 molecules of A3B2 will be formed.
3. ‘A’ is limiting reactant and 60 molecules of A3B2 will be formed.
4. ‘A’ is limiting reactant and 180 molecules of A3B2 will be formed.
5. ‘B’ is limiting reactant and 60 molecules of A3B2 will be formed
6. Copper has two naturally occurring isotopes 63Cu and 65Cu. If the average atomic mass of copper is 63.546 u, then natural abundance of lighter isotope of Cu will be:

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| --- | --- | --- | --- |
| a) 46.4 % | b) 27.3 % | c) 54.2 % | d) 72.2 % |

1. Out of the following statements choose an incorrect statement regarding components:
2. Constituents of compound can be separated by physical methods.
3. They can be decomposed by chemical methods.
4. Properties of a compound are different from those of its constituent elements.
5. Elements combine in a fixed proportion by mass in a compound.
6. Numerical prefix used for 1012 is:

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| --- | --- | --- | --- |
| a) Giga | b) Tera | c) Peta | d) Exa |

1. Number of carbon atoms present in 22 g of CO2 is:

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| --- | --- | --- | --- |
| a) 6.02 x 1023 | b) 3.01 x 1023 | c) 6.02 x 10 – 23 | d) 3.01 x 10 – 23 |

1. Mass of 1 amu in gram is:

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| --- | --- | --- | --- |
| a) 1.66 x 1024 | b) 1.66 x 10 – 24 | c) 1.008 | d) 9.1 x 10 – 28 |

1. The actual mass of a molecule of CO2 is:

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| --- | --- | --- | --- |
| a) 7.3 x 10 – 23 g | b) 6.02 x 10 – 23 g | c) 44 g | d) 3.65 x 10 – 23 g |

1. How many grams of H2SO4 are contained in 0.05 litres of 0.5 M solution?

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| a) 4.90 g | b) 9.80 g | c) 2.45 g | d) 3.98 g |

1. Volume of NTP of oxygen required to completely burn 1 kg of Coal (100% carbon):

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| --- | --- | --- | --- |
| a) 22400 L | b) 22.4 x 10 3 L | c) 1.86 x 10 3 L | d) 1000 L |

1. Avogadro’s number represents the number of molecules present in:

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| a) 1 cc gas at STP | b) 11.2 L of a gas at STP |
| c) 1 L of a gas at STP | d) 22.4 L of a gas at STP |

1. Number of moles of NaOH in 27 cm3 of 0.15 M NaOH solution is:

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| --- | --- | --- | --- |
| a) 0.15 | b) 27 | c) 0.00405 | d) 0.0405 M |

1. Which of these weighs most?

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| --- | --- |
| a) 32 g oxygen | b) 2 g atoms of nitrogen |
| c) 0.5 mole of iron | d) 3.01 x 1023 atoms of carbon |

1. Which contains greater number of oxygen atoms?

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| --- | --- |
| a) 1 gm of O | b) 1 gm of O2 |
| c) 1 gm of O3 | d) All have same number of oxygen atoms |

1. Number of atoms in 1 mL of ammonia gas at STP is:

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| --- | --- | --- | --- |
| a) 2.7 x 10 19 | b) 1.08 x 10 20 | c) 10.8 x 10 20 | d) 5.4 x 10 19 |

1. Calculate the number of gram-atoms in a sample of lead (At. Wt. = 207) weighing 100 grams:

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| --- | --- | --- | --- |
| a) 0.0483 | b) 0.24 | c) 4.8 | d) 0.48 |

1. Compute the mass in grams of KClO3 necessary to produce 67.2 litres of oxygen at STP according to the reaction : 2 KClO3 (s) 2 KCl (s) + 3 O2 (g). [Molecular weight of KClO3 = 122.5]

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| --- | --- | --- | --- |
| a) 96 | b) 2 | c) 122.5 | d) 245 |

1. Concentration of glucose (C6H12O6) in normal blood is approximately 90 mg per 100 mL. What is the molarity of the glucose solution in blood?

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| a) 5 M | b) 0.005 M | c) 0.05 M | d) 1 M |

1. How many grams of KCl must be added to 75 gm of water to produce a solution that is 2.25 molal (m)? [Molecular weight of KCl = 74.5]

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| --- | --- | --- | --- |
| a) 126 g | b) 63 g | c) 45 g | d) 12.57 g |

1. What is the mass of 0.5 moles of ozone (O3) molecules?

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| a) 8 g | b) 16 g | c) 24 g | d) 48 g |

1. 3 g of H2 react with 29 g of O2 to give water. The maximum amount of H2O formed is:

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| --- | --- | --- | --- |
| a) 32 g | b) 7.30 g | c) 0.73 g | d) 27 g |

1. The number of atoms in 52 amu of He are:

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| --- | --- |
| a) 13 atoms | b) 13 x 6.023 x 1023 atoms |
| c) 52 atoms | d) 52 x 6.023 x 1023 atoms |

1. 4 g of solid NaOH was dissolved in water and the solution was made up to 1000 mL. the whole of this will be neutralized completely:

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| --- | --- |
| a) 100 mL of 1 M H2SO4 | b) 20 mL of 2.5 M H2SO4 |
| c) 20 mL of 1.5 M H2SO4 | d) 30 mL of 5 M H2SO4 |

1. Equivalent mass of H3PO4 for the given reaction : H3PO4 + Ca(OH)2 CaHPO4 + 2 H2O .

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| --- | --- | --- | --- |
| a) | b) | c) 2 M | d) |

1. 1 atom of an element weighs 1.792 x 10 – 22 g. The atomic weight of element is:

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| --- | --- | --- | --- |
| a) 107.92 | b) 17.92 | c) 1.192 | d) 64 |

1. 5.6 L of gas at STP weighs equal to 8 g. The vapour density of the gas is:

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| --- | --- | --- | --- |
| a) 32 | b) 16 | c) 64 | d) 8 |

1. The normality of 1 M solution of H3PO4:

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| --- | --- | --- | --- |
| a) 0.5 N | b) 1 N | c) 2 N | d) 3 N |

1. Concentrated H2SO4 is 98 % by mass and has density of 1.84 g/cm3. What volume of the concentrated acid is required to make 5 L of 0.5 M H2SO4 solution?

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| --- | --- | --- | --- |
| a) 250 cm3 | b) 1.36 cm3 | c) 13.6 cm3 | d) 136 L |

1. 74.5 g of metal chloride contains 35.5 g of chlorine. The equivalent weight of metal is:

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| a) 74.5 | b) 39 | c) 35.5 | d) 7.45 |

1. ‘B’ has isotopes 10B (19 %) and 11B (81 %). The atomic mass of B is:

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| a) 10.81 | b) 105 | c) 11 | d) 10.5 |

1. The volume of one litre water upon vaporization at STP is nearly:

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| --- | --- | --- | --- |
| a) 124.3 L | b) 1244.4 L | c) 1 L | d) 22.4 L |

1. Which of the following has maximum number of atoms?

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| --- | --- |
| a) 1 g of Mg (s) [At. mass of Mg = 24] | b) 1 g of O2 (g) [At. mass of O = 16] |
| c) 1 g of Li (s) [At. mass of Li = 7] | d) 1 g of Ag (s) [At. mass of Ag = 108] |

1. One mole of carbon atom weighs 12g, the number of atoms in it is equal to \_\_\_\_. (Mass of carbon-12 is 1.9926 x 10 – 23 g).

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| --- | --- | --- | --- |
| a) 6.022 x 1023 | b) 1.2 x 1023 | c) 6.022 x 1022 | d) 12 x 1022 |

1. The density of 2 M aqueous solution of NaOH is 1.28 g/cm3. The molality of the solution is \_\_\_\_.

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| --- | --- | --- | --- |
| a) 1.32 m | b) 1.2 m | c) 1.56 m | d) 1.67 m |

1. The number of moles of Hydrogen molecules required to produce 20 moles of ammonia through Haber’s process is:

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| a) 10 | b) 20 | c) 30 | d) 40 |

1. In which case is number of molecules of water maximum?

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| --- | --- |
| a) 18 mL of water | b) 18 g of water |
| c) 10 – 3 mol of water | d) 0.00224 L of water vapours at 1 atm and 273 K |

1. Deuterium nucleus contains :

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| a) | b) | c) | d) |

1. In photoelectric effect, the kinetic energy of the photoelectrons increases linearly with the :

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| a) | b) |
| c) | d) |