

## **HOTS QUESTIONS**

1. Two oxides of a metal contain 27.6% and 30% of oxygen respectively. If the formula of the first compound is  $M_3O_4$ , find the formula of the second compound.
2. What is the mole fraction of the solute in 2.5m aqueous solution?
3. How many grams of  $Na_2CO_3$  should be dissolved to make  $100\text{ cm}^3$  of 0.15M  $Na_2CO_3$  solution?
4. 2N HCl solution will has the same molar concentration as \_\_\_\_ N  $H_2SO_4$ .
5. Boron occurs in nature in the form of two isotopes having atomic mass 10 and 11. What are the percentage abundances of the two isotopes in a sample of boron having average atomic mass 10.8?
6. How many atoms of sulphur are present in 0.1 moles of  $S_8$  molecules?
7. Calculate the total number of electrons present in 1.6g of methane.
8. A welding fuel gas contains carbon and hydrogen only. Burning a small sample of it in oxygen gives 3.38g of carbon dioxide, 0.690g of water and no other products. A volume of 10L (measured at NTP) of this welding gas is found to weigh 11.6g. Calculate:
  - (a) Empirical formula
  - (b) Molar mass of the gas, and
  - (c) Molecular formula.
9. An organic compound containing carbon, hydrogen and oxygen having following percentage composition: C=40.68%, H=5.08%. The vapour density of the compound is 59. Calculate the molecular formula of the compound.
10. How much marble of 96.5% purity would be required to prepare 100 litres of carbon dioxide at NTP when marble is acted upon by dil. HCl?
11. '3.0g of  $H_2$ ' react with '29.0g of  $O_2$ ' to yield  $H_2O$ .
  - (a) Which is the limiting reactant?
  - (b) Calculate the maximum amount of  $H_2O$  that can be formed.
  - (c) Calculate the amount of one of the reactants which remains unreacted.
12. Calculate the number of  $Cl^-$  ions in 100ml of 0.001M HCl solution.
13. How many moles of  $Mg_3(PO_4)_2$  will contain 0.25 moles of oxygen atoms?
14. Commercially available sulphuric acid contains 93% acid by mass and has a density of 1.84g/ml. Calculate:
  - (a) The molarity of the solution
  - (b) Volume of the sulphuric acid required to prepare 2.5L of 0.50M  $H_2SO_4$
15. Calculate the molarity of pure water (density of water=1g/ml).

**CLASS:** XI

**SUBJECT:** CHEMISTRY

**CHAPTER:** 1 (SOME BASIC CONCEPTS OF CHEMISTRY)

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