INDIAN SCHOOL DARSAIT
DEPARTMENT OF CHEMISTRY

Subject: Chemistry **Topic:** Some Basic Concepts of Chemistry Date of Worksheet :26.4.17

Resource Person: Jyothy Sukhadiya Date:

Name of Student: _____ Class & Division: XI : Roll No:

1.	State the laws : (a) Law of conservation of mass. (b) Law of multiple proportions. (c) Law of definite proportions. (d) Gay Lussac's Law of combining volumes (e) Avogadro Law.	1 each
2.	Chlorine has two isotopes of atomic mass units 35 and 37. The relative abundance of the isotopes is 75% and 25% respectively. Find the average atomic mass of chlorine.	2
3.	Calculate the: (a) Molecular mass of Glucose ($C_6H_{12}O_6$) (b) Formula mass of calcium chloride. (Atomic mass of C=12, O= 16, H=1, Ca= 40, Cl= 35.5)	2
4.	Calculate the percentage composition of water.	2
5.	What is the percentage of carbon, hydrogen and oxygen in ethanol?	2
6.	Calculate : (a) mass of an atom of Silver. (Atomic mass of Ag = 108) (b) Mass of one molecule of water.	2
7.	Calculate the number of molecules and atoms present in 224ml of Nitrogen gas at STP.	2
8.	Calculate the number of molecules and atoms present in 11.2 litres of oxygen at STP.	2
9.	Calculate the weight of sodium which contains same number atoms as are present in 15g of calcium. (Atomic mass of Ca = 40, Na= 23)	2
10.	What is the volume occupied by the following at NTP: i) 1.4g of nitrogen ii) 0.2 mole of NH_3 (Atomic mass of N = 14)	3
11.	a) At NTP, what will be the volume of molecules of 6.022×10^{21} H_2 ? b) 1L of a gas at STP weighs 1.97g. What is its molecular mass?	2
12.	Define the terms: (a) Limiting reagent (b) Relative Atomic Mass (c) Molar Mass (d) Molarity (e) Molality (f) Molar Volume (g) Empirical formula (h) Mole fraction	1 each
13.	A compound contains 2.68% Mg. How many atoms of magnesium are present in 15g of the compound?	2
14.	Calculate the number of atoms in each of the following (i) 52 moles of Ar (ii) 52 u of He (iii) 52 g of He (Atomic mass of He= 4)	3
15.	Write empirical formula of : C_6H_{12}, H_2O_2, H_3PO_4, Fe_2O_3	2
16.	A compound contains 5.08 % H, 40.68% C and rest oxygen. What is its empirical formula?	2
17.	A compound contains 54.2% carbon and 9.2 % hydrogen. If its molecular mass is 88u, find its molecular formula.	3

18.	A compound contains 4.07 % hydrogen, 24.27 % carbon and 71.65 % chlorine. Its vapour density is 49.48. What are its empirical and molecular formulas?	3
19.	Calculate the amount of water produced by the combustion of 16 g of methane?	2
20.	How many moles of methane are required to produce 22 g CO_2 after combustion?	2
21.	How many moles and grams of N_2 are needed to produce 8.2 moles of NH_3 by reaction with H_2?	2
22.	Calculate the weight of iron which will be converted into its oxide (Fe_3O_4) by the action of 14.4 g of steam on it. $3\ Fe + 4\ H_2O \rightarrow Fe_3O_4 + 4\ H_2$ (Atomic mass of iron= 56)	2
23.	3.0g of H_2 react with 29.0g of O_2 to yield H_2O. i) Which is the limiting reagent? ii) Calculate the maximum amount of H_2O that can be formed? iii) Calculate the amount of one of the reactants which remains unreacted?	
24.	Dinitrogen and dihydrogen react with each other to produce ammonia according to the following chemical equation: $N_2(g) + H_2(g) \rightarrow 2NH_3(g)$ (i) Calculate the mass of ammonia produced if 2.00×10^3 g dinitrogen reacts with 1.00×10^3 g of dihydrogen. (ii) Will any of the two reactants remain unreacted? (iii) If yes, which one and what would be its mass?	
25.	20grams of $CaCO_3$ is treated with 20g of HCl solution. Calculate the mass of CO_2 produced at STP according to the reaction, $CaCO_3$ (s) + 2 HCl (aq) $\rightarrow$ $CaCl_2$ (aq) + CO_2(g) + H_2O(l) [Atomic mass of Ca=40;C=12;H=1;O=16;Cl=35.5]	2
26.	20grams of $CaCO_3$ is mixed with 100cc of 3M HCl solution. Calculate the volume of CO_2 produced at STP. [Ca=40;C=12;H=1;O=16;Cl=35.5]	2
27.	$KClO_3$ on heating decomposes to KCl and O_2. What is the volume of O_2 at STP liberated by 0.1 mole of $KClO_3$?	2
28.	Calcium carbonate reacts with aqueous HCl to give $CaCl_2$ and CO_2 according to the reaction, $CaCO_3$ (s) + 2 HCl (aq) $\rightarrow$ $CaCl_2$ (aq) + CO_2(g) + H_2O(l) What mass of $CaCO_3$ is required to react completely with 25 mL of 0.75 M HCl?	3
29.	A solution is 25% water, 25% ethanol and 50% acetic acid by mass. Calculate the mole fraction of each component?	2
30.	What is the effect of temperature on molarity and molality?	2
31.	Calculate the molarity of NaOH in the solution prepared by dissolving its 4 g in enough water to form 250 mL of the solution.	2
32.	The density of 3 M solution of NaCl is 1.25 g mL^{-1}. Calculate molality of the solution.	2
33.	Commercially available H_2SO_4 contains 98% acid by mass. Find the molarity if density of the sample is 1.84g/cc. What volume of this acid is required to make 2 L of 0.1 M solution? [Molar mass of H_2SO_4 = 98g]	2
34.	A solution of glucose in water is labeled as 10% (w/w) . The density of the solution is 1.20g/ml. Calculate a) molality b) molarity and mole fraction of each component in solution. (Molecular mass of glucose = 180)	3