

Date Planned : __ / __ / __	Daily Tutorial Sheet - 1	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	JEE Main (Archive)	Exact Duration : _____

- Number of atoms in 558.5 gram Fe (At. wt. of Fe = 55.85 g mol<sup>-1</sup>) is (2002)  
 (A) twice that in 60 g carbon (B)  $6.023 \times 10^{22}$   
 (C) half that in 8 g He (D)  $558.5 \times 6.023 \times 10^{23}$
- If we consider that 1/6, in place of 1/12, mass of carbon atom is taken to be the relative atomic mass unit, the mass of one mole of a substance will (2005)  
 (A) decrease twice  
 (B) increase two folds  
 (C) remain unchanged  
 (D) be a function of the molecular mass of the substance
- How many moles of magnesium phosphate, Mg<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub> will contain 0.25 mole of oxygen atoms? (2006)  
 (A) 0.02 (B)  $3.125 \times 10^{-2}$  (C)  $1.25 \times 10^{-2}$  (D)  $2.5 \times 10^{-2}$
- In the reaction, (2007)  

$$2\text{Al}_{(s)} + 6\text{HCl}_{(aq)} \rightarrow 2\text{Al}_{(aq)}^{3+} + 6\text{Cl}_{(aq)}^{-} + 3\text{H}_{2(g)}$$
 (A) 11.2 L H<sub>2(g)</sub> at STP is produced for every 3 L H<sub>2(g)</sub> produced  
 (B) 6 L HCl<sub>(aq)</sub> is consumed for every 3 L H<sub>2(g)</sub> produced  
 (C) 33.6 L H<sub>2(g)</sub> is produced regardless of temperature and pressure for every mole Al that reacts  
 (D) 67.2 L H<sub>2(g)</sub> at STP is produced for every mole Al that reacts.
- 3 g of a hydrocarbon on combustion in excess of oxygen produces 8.8 g of CO<sub>2</sub> and 5.4 g of H<sub>2</sub>O. The data illustrates the law of: (2010)  
 (A) conservation of mass (B) multiple proportions  
 (C) constant proportions (D) none of these
- The molarity of a solution obtained by mixing 750 mL of 0.5 M HCl with 250 mL of 2 M HCl will be : (2013)  
 (A) 0.875 M (B) 1.00 M (C) 1.75 M (D) 0.0975 M
- A gaseous mixture contains oxygen and nitrogen in the ratio of 1 : 4 by weight. Therefore, ratio of their number of molecules is : (2014)  
 (A) 1 : 4 (B) 1 : 8 (C) 7 : 32 (D) 3 : 16
- A sample of a hydrate of barium chloride weighing 61 g was heated until all the water of hydration is removed. The dried sample weighed 52 g. The formula of the hydrated salt is: (2015)  
 (atomic mass, Ba = 137 amu, Cl = 35.5 amu)  
 (A) BaCl<sub>2</sub> · H<sub>2</sub>O (B) BaCl<sub>2</sub> · 2H<sub>2</sub>O (C) BaCl<sub>2</sub> · 3H<sub>2</sub>O (D) BaCl<sub>2</sub> · 4H<sub>2</sub>O
- $\text{A} + 2\text{B} + 3\text{C} \rightleftharpoons \text{AB}_2\text{C}_3$  (2015)  
 Reaction of 6.0 g of A,  $6.0 \times 10^{23}$  atoms of B, and 0.036 mol of C yields 4.8 g of compound AB<sub>2</sub>C<sub>3</sub>. If the atomic mass of A and C are 60 and 80 amu, respectively. The atomic mass of B is:  
 (Avogadro number =  $6 \times 10^{23}$ )  
 (A) 70 amu (B) 60 amu (C) 50 amu (D) 40 amu

10. The amount of arsenic pentasulphide that can be obtained when 35.5 g arsenic acid is treated with excess  $\text{H}_2\text{S}$  in the presence of conc.  $\text{HCl}$  (assuming 100% conversion) is : (Atomic mass of As = 75u)
- $$2\text{H}_3\text{AsO}_4 + 5\text{H}_2\text{S} \longrightarrow \text{As}_2\text{S}_5 + 8\text{H}_2\text{O} \quad (2016)$$
- (A) 0.50 mol      (B) 0.25 mol      (C) 0.125 mol      (D) 0.333 mol
11. An organic compound contains C, H and S. The minimum molecular weight of the compound containing 8% sulphur is : (Atomic weight of S = 32 amu) ▶ (2016)
- (A)  $200 \text{ g mol}^{-1}$       (B)  $400 \text{ g mol}^{-1}$       (C)  $600 \text{ g mol}^{-1}$       (D)  $300 \text{ g mol}^{-1}$
12. The volume of 0.1N dibasic acid sufficient to neutralize 1 g of a base that furnishes 0.04 mole of  $\text{OH}^-$  in aqueous solution is : ▶ (2016)
- (A) 200 mL      (B) 400 mL      (C) 600 mL      (D) 800 mL
13. What quantity (in mL) of a 45% acid solution of a mono-protic strong acid must be mixed with a 20% solution of the same acid to produce 800 mL of a 29.875% acid solution? ▶ (2017)
- (A) 320      (B) 325      (C) 316      (D) 330
14. 1 gram of a carbonate ( $\text{M}_2\text{CO}_3$ ) on treatment with excess  $\text{HCl}$  produces 0.01186 mole of  $\text{CO}_2$ . The molar mass of  $\text{M}_2\text{CO}_3$  in  $\text{g mol}^{-1}$  is: ▶ (2017)
- (A) 11.86      (B) 1186      (C) 84.3      (D) 118.6
15. The most abundant elements by mass in the body of a healthy human adult are: Oxygen (61.4%); Carbon (22.9%), Hydrogen (10.0%); and Nitrogen (2.6%). The weight which a 75 kg person would gain if all  $^1\text{H}$  atoms are replaced by  $^2\text{H}$  atoms is: (2017)
- (A) 10 kg      (B) 15 kg      (C) 37.5 kg      (D) 7.5 kg