

Date Planned : __ / __ / __	Daily Tutorial Sheet - 2	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	JEE Main (Archive)	Exact Duration : _____

16. Excess of $\text{NaOH}_{(\text{aq.})}$ was added to 100 mL of $\text{FeCl}_{3(\text{aq.})}$ resulting into 2.14 g of $\text{Fe}(\text{OH})_3$. The molarity of $\text{FeCl}_{3(\text{aq.})}$ is (2017)
- (Given: molar mass of Fe = 56 g mol^{-1} and molar mass of Cl = 35.5 g mol^{-1})
- (A) 0.2 M (B) 1.8 M (C) 0.3 M (D) 0.6 M
17. A sample of NaClO_3 is converted by heat to NaCl with a loss of 0.16 g of oxygen. The residue is dissolved in water and precipitated as AgCl . The mass of AgCl (in g) obtained will be ▶ (2018)
- (Given: Molar mass of AgCl = 143.5 g mol^{-1})
- (A) 0.54 (B) 0.35 (C) 0.48 (D) 0.41
18. For per gram of reactant, the maximum quantity of N_2 gas is produced in which of the following thermal decomposition reactions? (2018)
- (Given: Atomic wt. Cr = 52, u, Ba = 137 u)
- (A) $2\text{NH}_4\text{NO}_{3(\text{s})} \rightarrow 2\text{N}_{2(\text{g})} + 4\text{H}_2\text{O}_{(\text{g})} + \text{O}_{2(\text{g})}$
- (B) $\text{Ba}(\text{N}_3)_{2(\text{s})} \rightarrow \text{Ba}_{(\text{s})} + 3\text{N}_{2(\text{g})}$
- (C) $(\text{NH}_4)_2\text{Cr}_2\text{O}_{7(\text{s})} \rightarrow \text{N}_{2(\text{g})} + 4\text{H}_2\text{O}_{(\text{g})} + \text{Cr}_2\text{O}_{3(\text{s})}$
- (D) $2\text{NH}_{3(\text{g})} \rightarrow \text{N}_{2(\text{g})} + 3\text{H}_{2(\text{g})}$
19. An unknown chlorohydrocarbon has 3.55% of chlorine. If each molecule of the hydrocarbon has one chlorine atom only, chlorine atoms present in 1 g of chlorohydrocarbon are (Atomic wt. of Cl = 35.5 u; Avogadroconstant = $6.023 \times 10^{23} \text{ mol}^{-1}$) (2018)
- (A) 6.023×10^{21} (B) 6.023×10^{23}
- (C) 6.023×10^{20} (D) 6.023×10^9
20. The ratio of mass percent of C and H of an organic compound ($\text{C}_x\text{H}_y\text{O}_z$) is 6 : 1. If one molecule of the above compound ($\text{C}_x\text{H}_y\text{O}_z$) contains half as much oxygen as required to burn one molecule of compound C_xH_y completely to CO_2 and H_2O . The empirical formula of compound $\text{C}_x\text{H}_y\text{O}_z$ is : ▶ (2018)
- (A) $\text{C}_3\text{H}_4\text{O}_2$ (B) $\text{C}_2\text{H}_4\text{O}_3$ (C) $\text{C}_3\text{H}_6\text{O}_3$ (D) $\text{C}_2\text{H}_4\text{O}$
21. The amount of sugar ($\text{C}_{12}\text{H}_{22}\text{O}_{11}$) required to prepare 2 L of its 0.1 M aqueous solution is: (2019)
- (A) 34.2 g (B) 17.1 g (C) 136.8 g (D) 68.4 g
22. A solution of sodium sulfate contains 92 g of Na^+ ions per kilogram of water. The molality of Na^+ ions in that solution in mol kg^{-1} is: (2019)
- (A) 4 (B) 12 (C) 8 (D) 16
23. For the following reaction, the mass of water produced from 445 g of $\text{C}_{57}\text{H}_{110}\text{O}_6$ is: (2019)
- $2\text{C}_{57}\text{H}_{110}\text{O}_6(\text{s}) + 163\text{O}_2(\text{g}) \rightarrow 114\text{CO}_2(\text{g}) + 110\text{H}_2\text{O}(\text{l})$
- (A) 445 g (B) 495 g (C) 890 g (D) 490 g

24. A 10 mg effervescent tablet containing sodium bicarbonate and oxalic acid release 0.25ml of CO_2 at $T = 298.15\text{K}$ and $p = 1$ bar. If molar volume of CO_2 is 25.0L under such condition, what is the percentage of sodium bicarbonate in each tablet? [Molar mass of $\text{NaHCO}_3 = 84 \text{ g mol}^{-1}$] **(2019)**
(A) 33.6 (B) 8.4 (C) 0.84 (D) 16.8
25. 50 mL of 0.5 M oxalic acid is needed to neutralize 25 mL of sodium hydroxide solution. The amount of NaOH in 50 mL of the given sodium hydroxide solution is: **(2019)**
(A) 80 g (B) 20 g (C) 10 g (D) 4 gm
26. 8 g of NaOH is dissolved in 18 g of H_2O . Mole fraction of NaOH in solution and molality (in mol kg^{-1}) of the solution respectively are: **(2019)**
(A) 0.2, 11.11 (B) 0.167, 11.11 (C) 0.2, 22.20 (D) 0.167, 22.20
27. 25ml of the given HCl solution requires 30mL of 0.1M sodium carbonated solution. What is the volume of this HCl solution required to titrate 30mL of 0.2M aqueous NaOH solution? **(2019)**
(A) 25mL (B) 12.5mL (C) 72mL (D) 50mL
28. At 300 K and 1 atmospheric pressure, 10 mL of a hydrocarbon required 55 mL of O_2 for complete combustion, and 40 mL of CO_2 is formed. The formula of the hydrocarbon is: **(2019)**
(A) C_4H_6 (B) $\text{C}_4\text{H}_7\text{Cl}$ (C) C_4H_{10} (D) C_4H_8
29. For reaction, $\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \longrightarrow 2\text{NH}_3(\text{g})$; identify dihydrogen (H_2) as a limiting reagent in the following reaction mixtures. **(2019)**
(A) 28g of N_2 + 6g of H_2 (B) 56g of N_2 + 10g of H_2
(C) 14g of N_2 + 4g H_2 (D) 35g of N_2 + 8g of H_2
30. 5 moles of AB_2 weight $125 \times 10^{-3}\text{kg}$ and 10 moles of A_2B_2 weight $300 \times 10^{-3}\text{kg}$. The molar mass of $\text{A}(\text{M}_\text{A})$ molar mass of $\text{B}(\text{M}_\text{B})$ in kg mol^{-1} are: **(2019)**
(A) $\text{M}_\text{A} = 50 \times 10^{-3}$ and $\text{M}_\text{B} = 25 \times 10^{-3}$ (B) $\text{M}_\text{A} = 25 \times 10^{-3}$ and $\text{M}_\text{B} = 50 \times 10^{-3}$
(C) $\text{M}_\text{A} = 5 \times 10^{-3}$ and $\text{M}_\text{B} = 10 \times 10^{-3}$ (D) $\text{M}_\text{A} = 10 \times 10^{-3}$ and $\text{M}_\text{B} = 5 \times 10^{-3}$
31. The minimum amount of $\text{O}_2(\text{g})$ consumed per gram of reactant is for the reaction: **(2019)**
(Given atomic mass: Fe = 56, O = 16, Mg = 24, P = 31, C = 12, H = 1)
(A) $4\text{Fe}(\text{s}) + 3\text{O}_2(\text{g}) \rightarrow 2\text{Fe}_2\text{O}_3(\text{s})$ (B) $2\text{Mg}(\text{s}) + \text{O}_2(\text{g}) \rightarrow 2\text{MgO}(\text{s})$
(C) $\text{P}_4(\text{s}) + 5\text{O}_2(\text{g}) \rightarrow \text{P}_4\text{O}_{10}(\text{s})$ (D) $\text{C}_3\text{H}_8(\text{g}) + 5\text{O}_2(\text{g}) \rightarrow 3\text{CO}_2(\text{g}) + 4\text{H}_2\text{O}(\text{l})$
32. What would be the molality of 20% (mass/mass) aqueous solution of KI? **(2019)**
(molar mass of KI = 166 g mol^{-1})
(A) 1.48 (B) 1.51 (C) 1.08 (D) 1.35
33. The percentage composition of carbon by mole in methane is: **(2019)**
(A) 25% (B) 80% (C) 75% (D) 20%