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

16. A mixture of $H_2C_2O_4$ (oxalic acid) and $NaHC_2O_4$ weighing 2.02 g was dissolved in water and solution made up to one litre. Ten milliliters of the solution required 3.0 mL of 0.1 N sodium hydroxide solution for complete neutralization. In another experiment 10.0 mL of the same solution, in hot dilute sulphuric acid medium, required 4.0 mL of 0.1 N potassium permanganate solution for complete reaction. Calculate the amount of $H_2C_2O_4$ and $NaHC_2O_4$ in the mixture. **(1990)**

17. The volume strength of $1.5\,N\,H_2O_2$ solution is : **(1990)**

(A) 4.8 **(B)** 8.4 **(C)** 3.0 **(D)** 8.0

18. The oxidation number of phosphorus in $Ba(H_2PO_2)_2$ is : **(1990)**

(A) $+3$ **(B)** $+2$ **(C)** $+1$ **(D)** -1

19. A solid mixture (5.0 g) consisting of lead nitrate and sodium nitrate was heated below 600°C until the weight of the residue was constant. If the loss in weight is 28.0%, find the amount of lead nitrate and sodium nitrate in the mixture. **(1990)**

20. A solution of 0.2 g of a compound containing Cu^{2+} and $C_2O_4^{2-}$ ions on titration with 0.02 M $KMnO_4$ in presence of H_2SO_4 consumes 22.6 mL of the oxidant. The resultant solution is neutralized with Na_2CO_3, acidified with dil. acetic acid and treated with excess KI. The liberated iodine requires 11.3 mL of 0.5 M $Na_2S_2O_3$ solution for complete reduction. Find out the mole ratio of Cu^{2+} to $C_2O_4^{2-}$ in the compound. Write down the balanced redox reactions involved in the above titrations. **(1991)**

21. A 1.0 g sample of Fe_2O_3 solid of 55.2% purity is dissolved in acid and reduced by heating the solution with zinc dust. The resultant solution is cooled and made up to 100.0 mL. An aliquot of 25.0 mL of this solution requires 17.0 mL of 0.0167 M solution of an oxidant for titration. Calculate the number of electrons taken up by the oxidant in the reaction of the above titration. **(1991)**

22. One gram of commercial $AgNO_3$ is dissolved in 50 mL of water. It is treated with 50 mL of a KI solution. The silver iodide thus precipitated is filtered off. Excess of KI in the filtrate is titrated with (M/10) KIO_3 solution in presence of 6 M HCl till all I^- ions are converted into ICl. It required 50 mL of (M/10) KIO_3 solution. 20 mL of the same stock solution of KI requires 30 mL of (M/10) KIO_3 under similar conditions. Calculate the percentage of $AgNO_3$ in the sample. **(1992)**

Reaction : $KIO_3 + 2KI + 6HCl \longrightarrow 3ICl + 3KCl + 3H_2O$

23. For the redox reaction $MnO_4^- + C_2O_4^{2-} + H^+ \rightarrow Mn^{2+} + CO_2 + H_2O$ the correct coefficients of the reactants for the balanced reaction are : **(1992)**

	MnO_4^-	$C_2O_4^{2-}$	H^+		MnO_4^-	$C_2O_4^{2-}$	H^+
(A)	2	5	16	**(B)**	16	5	2
(C)	5	16	2	**(D)**	2	16	5

24. The value of n in the molecular formula $Be_n Al_2Si_6O_{18}$ is : **(1994)**

25. The compound $YBa_2Cu_3O_7$, which shows superconductivity, has copper in oxidation state _____.

Assume that the rare earth element yttrium is in its usual $+3$ oxidation state. **(1994)**

26. A $5.0\,cm^3$ solution of H_2O_2 liberates 0.508 g of iodine from an acidified KI solution. Calculate the strength of H_2O_2 solution in terms of volume strength at STP. **(1995)**

27. A 20.0 mL mixture of CO, CH_4 and He gases is exploded by an electric discharge at room temperature with excess of oxygen. The volume contraction is found to be $13.0\,cm^3$. A further contraction of $14.0\,cm^3$ occurs when the residual gas is treated with KOH solution. Find out the composition of the gaseous mixture in terms of volume percentage. **(1995)**

28. A 3.00 g sample containing Fe_3O_4, Fe_2O_3 and an inert impure substance, is treated with excess of KI solution in presence of dilute H_2SO_4. The entire iron is converted into Fe^{2+} along with the liberation of iodine. The resulting solution is diluted to 100 mL. A 20 mL of the dilute solution requires 11.0 mL of 0.5 M $Na_2S_2O_3$ solution to reduce the iodine, present. A 50 mL of the dilute solution after complete extraction of the iodine required 12.80 mL of 0.25 M $KMnO_4$ solution in dilute H_2SO_4 medium for the oxidation of Fe^{2+}. Calculate the % of Fe_2O_3 and Fe_3O_4 in the original sample. **(1996)**

29. To a 25 mL H_2O_2 solution, excess of acidified solution of potassium iodide was added. The iodine liberated required 20 mL of 0.3 N sodium thiosulphate solution. Calculate the volume strength of H_2O_2 solution. **(1997)**

30. The number of moles of $KMnO_4$ that will be needed to react with one mole of sulphite ion in acidic solution is : **(1997)**

(A) $\frac{2}{5}$ **(B)** $\frac{3}{5}$ **(C)** $\frac{4}{5}$ **(D)** 1