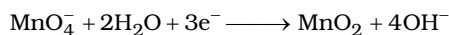


Daily Tutorial Sheet 7

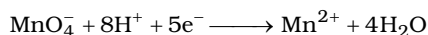
JEE Advanced (Archive)

92.(ACD)

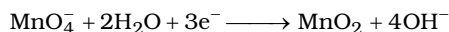
In alkaline medium,



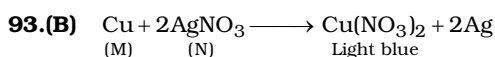
In acidic medium,



In neutral medium,

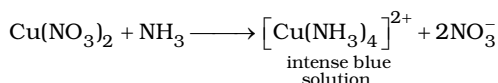
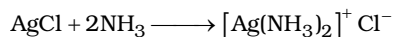
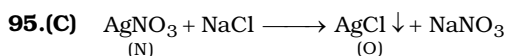


Hence, number of electrons gained in acidic, basic and neutral media are 5, 3 and 3 respectively.



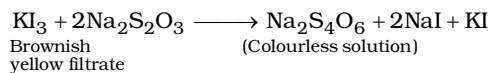
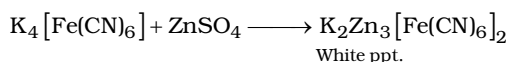
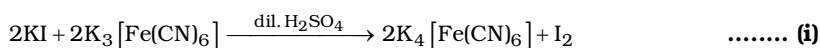
Cu partially oxidizes to $\text{Cu(NO}_3)_2$ and remaining AgNO_3 reacts with NaCl .

94.(A)



96.(A) The colour of aqueous solution of CuSO_4 is blue green. Thus, it absorbs orange-red colour and exhibit the complementary colour.

97.(ACD)



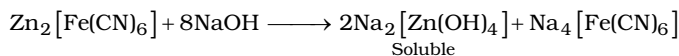
(A) is correct as in reaction (i), $\text{I}^-(-1)$ is being oxidised to $\text{I}_2(0)$ and Fe^{3+} is being reduced to Fe^{2+} .

(B) is incorrect as white precipitate is of $\text{K}_2\text{Zn}_3[\text{Fe(CN)}_6]_2$ or $\text{Zn}_2[\text{Fe(CN)}_6]$.

(C) is correct as $\underset{\text{filtrate}}{\text{I}_3^-} \rightleftharpoons \text{I}^- + \text{I}_2$

$\text{I}_2 + \text{starch} \longrightarrow \text{Blue colour}$

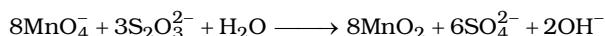
(D) is correct as white precipitate of $\text{K}_2\text{Zn}_3[\text{Fe(CN)}_6]_2$ or $\text{Zn}_2[\text{Fe(CN)}_6]$ is soluble in NaOH as



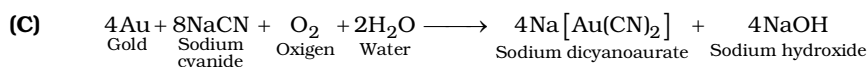
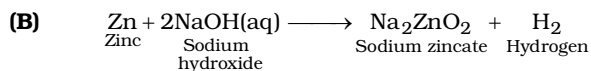
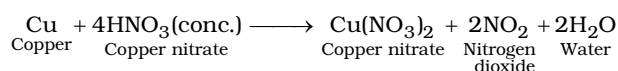
98.(ABC)

- (A) Cr^{2+} is a reducing agent, it gets oxidised to Cr^{3+} ($3d^3$ or t_{2g}^3 , stable half-filled configuration).
- (B) Mn^{3+} is an oxidizing agent, it gets reduced to Mn^{2+} ($3d^5$, most stable, half-filled configuration).
- (C) $\text{Cr}(24) : 3d^4 4s^2$ $\text{Mn}(25) : 3d^5 4s^2$
 $\text{Cr}^{2+} : 3d^4$ $\text{Mn}^{3+} : 3d^4$
 Both Cr^{2+} and Mn^{3+} exhibits d^4 electronic configuration.
- (D) When Cr^{2+} is used as a reducing agent, the chromium ion attains d^3 electronic configuration.

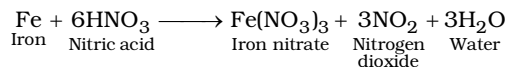
99.(6) In neutral of faintly alkaline solution, thiosulphate is oxidized to sulphate by permanganate,



100.(B) (A)



(D) Conc. HNO_3 makes iron passive. Cold relatively concentrated HNO_3 will reacts with Fe.



101.(ABC) Magnetic moment, $\mu = \sqrt{n(n+2)}$ B.M. where, n = No. of unpaired electrons

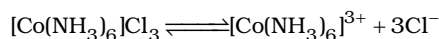
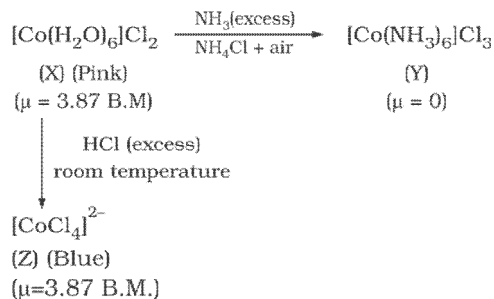
For X and Z : $\sqrt{n(n+2)} = 3.87$ B.M.

$$n^2 + 2n - 15 = 0 \Rightarrow n^2 + 5n - 3n - 15 = 0 \quad \therefore n = 3$$

For complex Y (1 : 3 electrolyte) : $\sqrt{n(n+2)} = 0 \Rightarrow n = 0$

$\text{CoCl}_2 \cdot 6\text{H}_2\text{O}$ or $[\text{Co}(\text{H}_2\text{O})_6]\text{Cl}_2$ (X) is pink coloured compound.

Adding excess of HCl at room temperature, changes (X) into $[\text{CoCl}_4]^{2-}$ (Z) and on adding excess of NH_3 and NH_4Cl in the presence of air forms $[\text{Co}(\text{NH}_3)_6]\text{Cl}_3$ (Y).



Thus, it is a 1 : 3 electrolyte. The hybridisation of Co in $[\text{Co}(\text{NH}_3)_6]\text{Cl}_3$ is d^2sp^3 (octahedral).

Adding of AgNO_3 to $[\text{Co}(\text{NH}_3)_6]\text{Cl}_3$ (Y) gives three equivalents of AgCl.

