Class-1
10.05.2021

Paper-XIII

3rd Yr

Class code
SGHIIP1



(Practical Paper).

(Inorganic quantitative Practical)

FM = 60

| | | | |
|---|---|---|---|
| 1) | Estimation ⟶ | (20+10) = 30. | Offline exam. |
| 2) | Inorganic complex salt Prep$^2$ | = 10 | |
| 3) | viva | = 10 | |
| 4) | LNB | = 10 | |

online exam.

Practical based written test

Syllabus.

1) Estimation :- ⟶ Binary mix

gm/lt ⟵ $M_1$ $M_2$ ⟶ gm/lt

(Cionic form).

eg i) Fe/Cu
ii) Fe/Cr.
iii) Fe/Ca.
iv) Ba/Ca

Fe ⟶ 20%
Cu/Ca/Cr ⟶ 10%

2019 ⟶ last Practical.
Fe/Cu

2018 ⟶ Fe/Ca

1) $K_2Cr_2O_7$ - eqv wt.

Let M.wt - M.

$$\overset{+6}{K_2Cr_2O_7} \rightleftharpoons 2K^{+} + \overset{+6}{Cr_2O_7}^{2-}$$

$\overset{+6}{Cr_2O_7}^{2-}$ - $Cr \rightarrow x$

$2 \times x + 7(-2) = 2-$

$\Rightarrow x = +6$

$$\overset{+6}{Cr_2O_7}^{2-} + 14H^{+} + 6e \rightleftharpoons 2\overset{+3}{Cr}^{3+} + 7H_2O$$

Eqv. wt of $K_2Cr_2O_7 = \frac{M}{\text{no. of electron exchange}}$

$K_2Cr_2O_7$

$(2 \times 39) + (2 \times 52) + (7 \times 16)$

$= 78 + 104 + 112$

$= 294$

$= \frac{294}{6}$

$= 49$

2) $KMnO_4 \rightarrow$ Eqv wt

$KMnO_4 \rightleftharpoons K^{+} + MnO_4^{-}$

$$\overset{+7}{MnO_4}^{-} + 8H^{+} + 5e \rightleftharpoons Mn^{2+} + 4H_2O$$

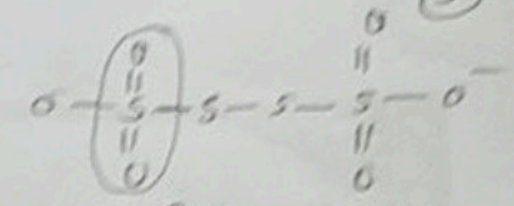
$x + 4(-2) = -1$

$x = +7$

$\frac{M.wt}{5} = \frac{159}{5} = 31.8$

$KMnO_4 \rightarrow (39 + 56 + 64) = 159$

3) $Na_2S_2O_3.5H_2O$



$2S_2O_3^{2-} \longrightarrow S_4O_6^{2-} + 2e$

Thiosulphate → Reductant

$S_4O_6^{2-}$

$4x + (-2)\times 6 = -2$

$\Rightarrow 4x = 12 - 2 = 10$

$x = +2.5$

$S_2S_2O_6^{2-}$

$2(+6) + 2x + 6(-2) = -2$

$\Rightarrow 12 + 2x - 12 = -2$

$\Rightarrow 2x = -2$

$x = -1$

+2 → −1 ; 0 → +6

$8 + 2x - 12 = -2$

$\Rightarrow 2x = 12 - 2 - 8 = 2$

$\frac{Mwt}{2}$ = ✗

$\frac{M.wt}{\text{no. of electron release or accept per ion}}$

$= \frac{M.wt}{1}$

$= \frac{(2\times 23) + (32\times 2) + (3\times 16) + (5\times 18) + 90}{1}$

$= \frac{(46 + 64 + 48 + 90)}{1}$

$= \frac{248}{1} = 248.$

4) Mohr's salt

$(NH_4)_2SO_4.FeSO_4.6H_2O$

Reductant ⇒ $M = 392.$

Equ wt $= \frac{392}{1} = 392.$

$Fe^{2+} \rightarrow Fe^{3+} + e$

* Prep$^{n}$ of 250 ml $\frac{N}{10}$ $K_2Cr_2O_7$ soln

$K_2Cr_2O_7 \longrightarrow$ 49. (eqv. wt)

1000 ml soln 1(N) — 49 gm $K_2Cr_2O_7$

1 " " 1(N) $\frac{49}{1000}$ "

250 " " 0.1 (N) $\frac{49 \times 250 \times 0.1}{1000}$ "

$= 1.225$ "

(HW) 100 ml 1(N) $K_2Cr_2O_7$ = ?

$x$ = gm $K_2Cr_2O_7$.

$x$ - ?

* 250 ml 1(N) oxalic acid soln:

?? gm oxalic acid.

$COOH \cdot COOH \cdot 2H_2O \longrightarrow$ M.wt - $C_2O_4H_2 \cdot 2H_2O$

$(2\times12) + (4\times16) + (2\times1) + 2\times18$

$= 24 + 64 + 2 + 36$

$= 126$

$COO^{\ominus} \cdot COO^{\ominus} \longrightarrow 2CO_2 + 2e$

(reductant) Eqv. wt $= \frac{M}{2} = \frac{126}{2} = 63$

1000 ml 1(N) - 63 gm

250 " 0.1(N) = $\frac{63 \times 250 \times 0.1}{1000} = 1.575$.