M.H. Khan 23-4-20 " XIth
Topic - Equi + Prob " Marwari College

*x 5 $\quad 2\,Fe^{+2}S_2^{-2} \longrightarrow Fe_2O_3 + 4SO_2$.

$n\ factor = \frac{22}{2} = 11$.

$2Fe^{+2} \longrightarrow 2Fe^{+3} + 2e^-$

$4S^{-1} \longrightarrow 4S^{+4} + 20e^-$

(-4). $\quad (+16) \quad \overline{22e^-}$

(B) ① Equivalent wt. of intra-molecular redox rxn.

$n\text{-factor} = \frac{\text{Loss of } e^- = \text{gain of } e^-}{\text{Stoichiometric coefficient}}$.

1. $\overset{+2}{Ca}\,\overset{-2}{O} \longrightarrow \overset{0}{Ca} + \frac{1}{2}\overset{0}{O_2}$ (②, ②)

$n\text{-factor} = \frac{2}{1}$.

2. $KClO_3 \longrightarrow KCl + \frac{3}{2}O_2$

O: $+6 \rightarrow 0$; Cl: $(+5) \rightarrow (-1)$ ⑥

$n\text{-factor} = \frac{6}{1}$.

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(c) Equivalent wt. of ~~Disproport.~~ Disproportionation rxn.

$n_2 = 2$

MnO_4^{-2} ⊖ $\longrightarrow$ $MnO_4^- + MnO_2$

(+6) (+7) +4.

$n = 1$.

$$n\text{-factor} = \frac{n_1 \times n_2}{n_1 + n_2} = \frac{1 \times 2}{1+2} = \frac{2}{3}.$$

$(MnO_4^{-2} \longrightarrow MnO_4^- + 1e^-) \times 2$

$2e^- + MnO_4^{-2} \longrightarrow MnO_2$

(+6) (+4)

$3MnO_4^{-2} \longrightarrow 2e^-$

$MnO_4^{-2} \longrightarrow \frac{2}{3}$.

$n_2 = 2$

$20 = -2$

$0 = -1$

2 $H_2O_2 \longrightarrow 2H_2O + O_2$

$20 = -4$

$0 = -2$

$n_1 = 2$

$$n\text{-factor} = \frac{2 \times 2}{2+2} = \frac{4}{4} = 1$$

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Important examples

(1) $KMnO_4$ (+7) → Mn^{+2} (Acidic) n-factor
→ Mn^{+4} (Basic) n-factor
→ Mn^{+4} (neutral) n-fact
→ Mn^{+6} (highly basic) n-

(2) $K_2Cr_2O_7$ (+12) → $2Cr^{+3}$ (+6) (Acidic) n-factor =

(3) $Fe^{+2} \longrightarrow Fe^{+3}$ n-factor = 1.

(4) $C_2O_4^{-2} \longrightarrow 2CO_2$ nf = 2.
C = +3 C = +4
2C = +6 2C = +8

(5) $KI \longrightarrow KIO_3$ (Basic) nf = 6
(−1) (+5)

(6) $Sn^{+2} \longrightarrow Sn^{+2}$ nf = 2.

(7) $SO_3^{-2} \longrightarrow SO_4^{-2}$ n-factor = 2
(+4) (+6)

A — Application of law of equivalents
(i) Acid – Base titration.
Eq. of Acid = Eq. of Base

eg. = $\frac{w}{E}$ = N × V(l)
= Molarity × V.f × V(l)
= mol...

M.H.Chan 23-4-20, D_2(S)
TOPIC → Para, dia, col, M, ferro etc
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Paramagnetic : when atleast one unpair e⁻ present and strongly attracted towards magnet due to obtain stability. when no of unpair e⁻ ↑es then ↑es paramagnetic nature and dipole moment.

Diamagnetic :- when unpair e⁻ absent that is only paired e⁻s are present. Hence can not be attracted towards magnet.

Ferromagnet :- when compound having unpair e⁻ and strongly attracted towards magnet due to domain formation (the irregular arrangement of e⁻) eg :- Fe, Co, Ni and CrO₂

Colour compound :- when d¹, d², d³, d⁴, d⁶, d⁷, d⁸, d⁹ configuration present than show coloured due to d-d transition. (transfer of e⁻ from 1 d-orbital to another d-orbital after giving some amount of energy in form of sunlight and hν.

colourless compound :- when d^0, d^5 and d^{10} configuration not than show colourless due to absence of d-d transition because of absence of e⁻ in d, half filled stable

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→ Example, marwari college.
→ magnetic moment $\mu = \sqrt{n(n+2)}$ B.M
n = No. of unpair e⊖.

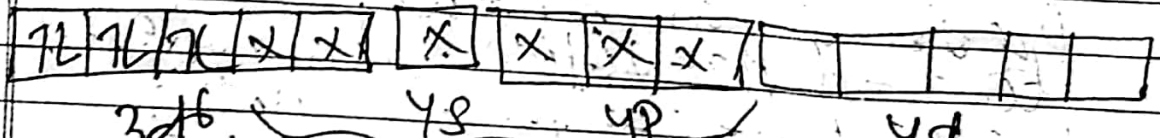
configuration d^5, and full filled configuration d^{10}.

- Hybridisation = No. of ligand
= C.O-ordination no. = Secondary valency = Non-replacable = Non-reactive = Non-ionizable = Non-replacable = No. of vacant orbitals on right side.
- If strong ligand present than use dsp hybrid orbital. NH_3 and H_2O acts as strong ligand with cobalt and copper.
- All ligand acts as strong ligand with 5th, 6th and 7th period elements

$K_4[Fe(CN)_6]$ → $4 + x - 6 = 0$ ⇒
↓ strong ligand.

$x = 2$, $Fe_{26} \rightarrow [Ar]\, 3d^6 4s^2$

$Fe^{2+} \rightarrow [Ar]\, 3d^6 4s 4p 4d$



d²sp³ → octahedral.

→ It is diamagnetic due to absence of unpair e⊖.
→ It is coloured due to configuration.
→ $\mu = \sqrt{n(n+2)}$ B.M, $n = 0$, $\mu = 0$
→ C.N = 6, 2°V = 6