439. [D]

Mg^{+2} has electronic configuration $1s^2$ $2s^2 2p^6$; no unpaired electrons

$_{22}Ti^{3+}$ has electronic configuration (Ar) $3d^1$; one unpaired electron.

V^{3+} has electronic configuration (Ar) $3d^2$; two unpaired electrons.

Fe^{2+} has electronic configuration (Ar) $3d^6$; four unpaired electrons .

440. [C]

$\sqrt{n(n+2)} = 5.93$

$\Rightarrow n = 5$

(A) $Cr \rightarrow [Ar]4s^1 3d^5$

$\Rightarrow Cr^{2+} \rightarrow [Ar]\ 4s^0 3d^4$

$\Rightarrow$ no. of unpaired electron = 4

(B) $V \rightarrow [Ar]\ 4s^2, 3d^3$

$V^{3+} \rightarrow [Ar]\ 3d^1$

$\Rightarrow$ unpaired electron = 1

(C) $Mn \rightarrow [Ar]\ 4s^2, 3d^5$

$Mn^{2+} \rightarrow [Ar]\ 4s^0, 3d^5$

$\Rightarrow$ unpaired electron = 5

(D) $Fe \rightarrow 4s^2, 3d^6$

$\Rightarrow Fe^{2+} \rightarrow [Ar]\ 4s^0, 3d^6$

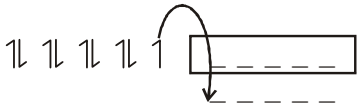
$\Rightarrow$ unpaired electron = 4

441. [C]

$K_2[Cu(CN)_4] \Rightarrow Cu^{2+}$

$Cu \rightarrow 4s^1\ 3d^{10}$

$\Rightarrow Cu^{2+} \rightarrow 4s^0\ 3d^9$



$\Rightarrow$ hyb $\rightarrow dsp^2$

mganetic moment $\sqrt{1 \times 3}$ {unpaired excited in 4}

= 1.73 BM

$Cu[(CN)_4]^{2-}$ is a square planar complex. Cu in this complex is n + 2 (d^9) oxidatin state. There is only one unpaired electron (n = 1).

442. [D]

$K_3[Fe(CN)_5CO]$

Potassium carbonylpentacyanoferrate (II)

As there are two ligands, carbonyl and cyano hence these must be arranged alphabetically and iron has oxidation state + 2 .

443. [C]

The compound containing unpaired electron in metal cation would be coloured

(A) $Zn(NO_3)_2$

$\Rightarrow Zn^{2+}$

$\Rightarrow 4s^0\ 3d^{10}$

$\Rightarrow$ unpaired electron = 0

(B) $LiNO_3$

$\Rightarrow Li^+$

$\Rightarrow 1s^2$

$\Rightarrow$ unpaired electron = 0

(C) $Co(NO_3)_2$

$\Rightarrow Co^{2+}$

$\Rightarrow 4s^0\ 3d^7$

$\Rightarrow$ unpaired electron = 3

(D) $K_2SO_4.H_2(SO_4)_3.\ 24H_2O$

$\Rightarrow$ Unpaired unpaired $e^- = 0$

$e^- = 0$

$\Rightarrow Co(NO_3)_2$ would be compond.

444. [B]

for Cr^{3+}

$\Rightarrow H_2O$ acts as SFL.

$\Rightarrow [Cr(H_2O)_6]^{3+}$ has highest SFL

445. [B]

+2 +4

$MnSO_4 \rightarrow MnO_2$

There is transfer of two electrons

$$\text{Eq. mass} = \frac{\text{Molecular mass}}{\text{Number of electrons transferred}}$$

$$= \frac{\text{Molecular mass}}{2}$$

446. [D]

Formula of the complex salt is $[Pt(NH_3)_4Cl]Cl_3$

$[Pt(NH_3)_4Cl]Cl_3 \longleftrightarrow [Pt(NH_3)_4Cl]^+ + 3Cl^-$

Total ion = 4

447. [B]

Ag^+ has d^{10} configuration with no unpaired electron.

448. [B]

Fe^{2+} has d^6 configuration and is expected to be most paramagnetic with four unpaired electrons.

449. [B]

(MA_5B) will not show geometrical isomerism.

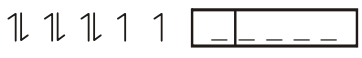
450. [B]

The coordination entity has four chloride ions,

451. [B]

$[NiCl_4]^{2-}$

$\Rightarrow Ni^{2+}\ 4s^0, 3d^8$

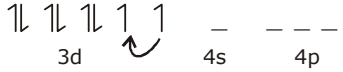


3d 4s 4p

$\Rightarrow$ Hyb sp^3, tetrahedral

$[Ni(CN)_4]^{2-}$ $Ni^{2+}\ 4s^0, 3d^8$

$CN \rightarrow$ SFL



3d 4s 4p

$\Rightarrow$ Hyb dsp^2 sq. planer

Primary valency = 0.5 of transition metal

Secondary valency = C.N. of T.M.

452. [A]

(A) $[Co(NH_3)_6]Cl_3 \rightarrow [Co(NH_3)_6]^{3+} + 3Cl^-$

Total ion = 4

$[Pt(NH_3)_5]Cl_3 \rightarrow$ Total ion = 4

(B) $[Co(NH_3)_6]Cl_3$

Total ion = 4

$[Pt(NH_3)_3Cl_3]Cl$

Total ion = 2

(C) $[Co(NH_3)_5Cl]Cl_2$

Total ion = 3

$[Pt(NH_3)_6]Cl_4$

total ion = 5

(D) $[Co(NH_3)_4Cl_2]Cl$

Total ion = 2

$[Pt(NH_3)_4Cl_2]Cl_2$

Total ion = 3

Same no. of ion = same electrical conductance.

453. [B]

$C_2O_4^{2-}$ is ligand

and a chelating ligand and hence most stable complex compound would be formed in can $C_2O_4^{2-}$.

454. [C]

More than value of K, more forward the reaction would be indicating the strong nature of ligand

455. [B]

$[Cr(NH_3)_4Cl_2]^+$ has POS will be optically inactive

456. [B]

$[Cr(H_2O)_6]^{3+}$

$Cr \rightarrow 4s^1\ 3d^5$

$Cr^{3+} \rightarrow 3d^3\ 4s^0$

$\Rightarrow$ No. of unpaired electron = 3

457. [A]

$[Pt(NH_3)_5Br]Br_3 \rightarrow [Pt(NH_3)_5Br]^{3+} + 3Br^-$

Total no. of ion produced = 4

458. [C]

Value of stability constant α strength of the ligand

$\Rightarrow CN^-$ would be strongest ligand

459. [D]

$\mu_{spin} = 4.9$

$\Rightarrow \sqrt{n(n+2)} = 4.9 \Rightarrow n = 4$

$\Rightarrow$ unpaired electron

(A) $[Fe(CN)_6]^{3-} \Rightarrow Fe^{3+}\ \ 4s^0\ \ 3d^5$

unpaired = 1

(B) $[Fe(H_2O)_6]^{3+} \Rightarrow Fe^{3+}\ \ 3d^5$

unpaired electron = 5

(C) $[Fe(CN)_6]^{4-} \Rightarrow Fe^{3+}\ \ 3d^6$

unpaired electron = 0

(D) $[Fe(H_2O)_6]^{2+} \Rightarrow Fe^{3+}$ 3d 4s 4p

unpaired electron = 4

μ_{spin} = 4.9 BM

460. [A]

M.M. = 1.73 BM

$\Rightarrow \sqrt{n(n+2)} = 1.73$

$\Rightarrow$ n = 1

(A) $[Mn(CN)_6]^{4-}$

$\Rightarrow M^{2+}\ \ 3d^5$

unpaired electron = 1

(B) $[Co(NH_3)_6]^{3-}$

$\Rightarrow Co^{2+}\ \ 3d^6$

unpaired electron = 0

(C) $[MnF_6]^{3-}$

$\Rightarrow Mn^{3+}$

$\uparrow\uparrow\uparrow\uparrow$ _ _ _ _ _

3d 4s 4p

unpaired electron = 4

461. [C]

Noble metal blue Au, Pt, Ir are not effect by conc HNO_3 or conc H_2SO_4 they are only affected by aqua regia. Au is used in photography (present in photograph) Ag + $AuCl_3 \rightarrow AgCl + Au$

462. [B]

463. [A]

d^5

1 1 1 1 1

with SFL, unpaired e = 1

with WFW, unpaired e = 5

(B) $\uparrow\downarrow\ \uparrow\downarrow\ \uparrow\downarrow$ 1 1

SFL or WFL, no unpaired e = 2

(C) d^6

$\uparrow\downarrow$ 1 1 1 1 _ _ _ _ _

3d 4S 4p

with SFL unpaired e= 0

(D) correct as in care of d^A, to d^7, no. of ungain evhor depar upon the nature of hige

464. [D]

$[Cr(CN)_6]^{3-}$ RAN = 24+12−3

= 33

$\left[\overset{+}{Cu}(CN)_4\right]^{3-}$ EAN=29+4×2

= 36