

COORDINATION COMPOUNDS AND POLYMERS

- \*  **$K_3(Al(C_2O_4)_3)$  is called**  
(a) Potassium aluminooxalate (b) Potassiumtrioxalatoaluminate (III)  
(c) Potassium aluminium (III) oxalate (d) Potassiumtrioxalatoaluminate (VI)

**Ans : (b) Potassiumtrioxalatoaluminate (III)**

- \* **Which of the following is common donor atom in ligands?**  
(a) arsenic (b) nitrogen (c) oxygen (d) both 'b' and 'c'

**Ans: (d) both 'b' and 'c'**

- \* **The formula for the complex, dichlorobis (urea) copper (II) is**  
(a)  $[Cu\{O=C(NH_2)_2\}Cl_2]$  (b)  $[Cu\{O=C(NH_2)_2Cl\}Cl]$   
(c)  $[CuCl_2\{O=C(NH_2)_2\}_2]$  (d)  $[CuCl_2\{O=C(NH_2)_2\}]_2$

**Ans: (c)  $[CuCl_2\{O=C(NH_2)_2\}_2]$**

- \* **In which of the following compounds does iron exhibit zero oxidation state?**  
(a)  $[Fe(H_2O)_6](NO_3)_3$  (b)  $K_3[Fe(CN)_6]$   
(c)  $K_4[Fe(CN)_6]$  (d)  $[Fe(CO)_5]$

**Ans: (d)  $[Fe(CO)_5]$**

- \* **The hypothetical complex chloridodiaquatriammincobalt(III)chloride can be represented as**  
(a)  $[CoCl(NH_3)_3(H_2O)_2]Cl_2$  (b)  $[Co(NH_3)_3(H_2O)Cl_3]$   
(c)  $[Co(NH_2)_3(H_2O)_2Cl]$  (d)  $[Co(NH_3)_3(H_2O)_3]Cl_3$

**Ans: (a)  $[CoCl(NH_3)_3(H_2O)_2]Cl_2$**

- \* **The oxidation state of Cr in  $[Cr(NH_3)_4Cl_2]^+$  is**  
(a) 0 (b) +1 (c) +2 (d) +3

**Ans: (d) +3**

- \* **The IUPAC name of the coordination compound  $K_3[Fe(CN)_6]$  is**
- (a) Tripotassiumhexacyanidoiron (II)      (b) Potassium hexacyanidoiron (II)  
(c) Potassiumhexacyanidoferrate (III)      (d) Potassium hexacyanidoferrate(II)

**Ans: (c) Potassiumhexacyanidoferrate (III)**

- \* **The IUPAC name for the complex  $[Co(ONO)(NH_3)_5]Cl_2$  is**

- (a) pentaamminenitro-N-cobalt (II) chloride  
(b) pentaamminenitrito-O-cobalt (III) chloride  
(c) nitrito-N-pentaamminecobalt (III) chloride  
(d) nitrito-N-pentaamminecobalt (II) chloride

**Ans: (b) pentaamminenitrito-O-cobalt (III) chloride**

- \*  **$[EDTA]^{4-}$  is a:**

- (a) monodentate ligand      (b) bidentate ligand  
(c) quadridentate ligand      (d) hexadentate ligand

**Ans: (d) hexadentate ligand**

- \* **In  $K_4[Fe(CN)_6]$ , the E.A.N. of Fe is**

- (a) 33      (b) 35      (c) 36      (d) 26

**Ans: (c) 36**

- \* **Pick out the complex compound in which the central metal atom obeys EAN rule strictly**

- (a)  $K_4[Fe(CN)_6]$       (b)  $K_3[Fe(CN)_6]$   
(c)  $[Cr(H_2O)Cl_3]$       (d)  $[Cu(NH_3)_4]SO_4$

**Ans: (a)  $K_4[Fe(CN)_6]$**

- \* **The number of geometrical isomers for  $[Pt(NH_3)_2 Cl_2]$  is**

- (a) 2      (b) 1      (c) 3      (d) 4

**Ans: (a) 2**

\* **The total number of possible isomers for the complex compound  $[\text{Cu}^{\text{II}}(\text{NH}_3)_4][\text{Pt}^{\text{II}}\text{Cl}_4]$**

- (a) 3            (b) 6            (c) 5            (d) 4

**Ans: (d) 4**

\* **Which one of the following octahedral complexes will not show geometric isomerism? (A and B are monodentate ligands)**

- (a)  $[\text{MA}_5\text{B}]$     (b)  $[\text{MA}_2\text{B}_4]$     (c)  $[\text{MA}_3\text{B}_3]$     (d)  $[\text{MA}_4\text{B}_2]$

**Ans: (a)  $[\text{MA}_5\text{B}]$**

\* **Which of the following coordination compounds would exhibit optical isomerism?**

- (a) pentamminenitrocobalt(III) iodide  
(b) diamminedichloridoplatinum(II)  
(c) trans-dicyanobis(ethane-1, 2-diamine) chromium (III) chloride  
(d) tris(ethane-1, 2-diamine) cobalt (III) bromide

**Ans: (d) tris(ethane-1, 2-diamine) cobalt (III) bromide**

\* **The type of isomerism present in Pentamminenitrochromium (III) chloride is**

- (a) Optical    (b) linkage    (c) ionization    (d) polymerisation

**Ans: (b) linkage**

\* **Which of the following compounds shows optical isomerism?**

- (a)  $[\text{Co}(\text{CN})_6]^{3-}$                       (b)  $[\text{Cr}(\text{C}_2\text{O}_4)_3]^{3-}$   
(c)  $[\text{ZnCl}_4]^{2-}$                           (d)  $[\text{Cu}(\text{NH}_3)_4]^{2+}$

**Ans: (b)  $[\text{Cr}(\text{C}_2\text{O}_4)_3]^{3-}$**

\* **Which would exhibit co-ordination isomerism**

- (a)  $[\text{Cr}(\text{NH}_3)_6][\text{Co}(\text{CN})_6]$     (b)  $[\text{Co}(\text{en})_2\text{Cl}_2]$   
(c)  $[\text{Cr}(\text{NH}_3)_6]\text{Cl}_3$             (d)  $[\text{Cr}(\text{en})_2\text{Cl}_2]^+$

**Ans: (a)  $[\text{Cr}(\text{NH}_3)_6][\text{Co}(\text{CN})_6]$**

\*  $[\text{Co}(\text{NH}_3)_5\text{NO}_2]\text{Cl}_2$  and  $[\text{Co}(\text{NH}_3)_5(\text{ONO})]\text{Cl}_2$  are related to each other as

- (a) geometrical isomers      (b) optical isomers  
 (c) linkage isomers          (d) coordination isomers

**Ans: (c) linkage isomers**

\* **Coordination isomerism is caused by the interchange of ligands between the**

- (a) cis and trans structure      (b) complex cation and complex anion  
 (b) Inner sphere and outer sphere      (d) low oxidation and higher oxidation states

**(b) Complex cation and complex anion**

\* **The number of precipitable halide ions in the sample  $[\text{Pt}(\text{NH}_3)\text{Cl}_2\text{Br}]\text{Cl}$  will be**

- (a) 2      (b) 3      (c) 4      (d) 1

**Ans: (d) 1**

• **Which of the following is considered to be an anticancer species?**

- (A)  $\left( \begin{array}{c} \text{Cl} \quad \text{CH}_2=\text{CH}_2 \\ \diagdown \quad / \\ \text{Pt} \\ / \quad \diagdown \\ \text{Cl} \quad \text{Cl} \end{array} \right)$       (B)  $\left( \begin{array}{c} \text{Cl} \quad \text{Cl} \\ \diagdown \quad / \\ \text{Pt} \\ / \quad \diagdown \\ \text{Cl} \quad \text{Cl} \end{array} \right)$
- (C)  $\left( \begin{array}{c} \text{H}_3\text{N} \quad \text{Cl} \\ \diagdown \quad / \\ \text{Pt} \\ / \quad \diagdown \\ \text{H}_3\text{N} \quad \text{Cl} \end{array} \right)$       (D)  $\left( \begin{array}{c} \text{H}_3\text{N} \quad \text{Cl} \\ \diagdown \quad / \\ \text{Pt} \\ / \quad \diagdown \\ \text{Cl} \quad \text{NH}_3 \end{array} \right)$

**Ans :**

- (C)  $\left( \begin{array}{c} \text{H}_3\text{N} \quad \text{Cl} \\ \diagdown \quad / \\ \text{Pt} \\ / \quad \diagdown \\ \text{H}_3\text{N} \quad \text{Cl} \end{array} \right)$

\* **Which one of the following will show paramagnetism corresponding to 2 unpaired electrons?(Atomic number: Ni= 28, Fe = 26)**

- a)  $[\text{FeF}_6]^{3-}$       (b)  $[\text{NiCl}_4]^{2-}$       (c)  $[\text{Fe}(\text{CN})_6]^{3-}$       (d)  $[\text{Ni}(\text{CN})_4]^{2-}$

**Ans: (b)  $[\text{NiCl}_4]^{2-}$**

\* **[Cr(H<sub>2</sub>O)<sub>6</sub>]Cl<sub>3</sub> (at no. of Cr=24) has a magnetic moment of 3.83 B.M. The correct distribution of 3d electrons in the Chromium of the complex is**

- (a)  $3d_{xy}^1, (3d_{x^2-y^2})^1, 3d_{yz}^1$                       (b)  $3d_{xy}^1, 3d_{yz}^1, 3d_{xz}^1$   
(c)  $3d_{xy}^1, 3d_{yz}^1, 3d_z^2$                       (d)  $(3d_{x^2-y^2})^1, 3d_z^2, 3d_{xz}^1$

**Ans: (b)  $3d_{xy}^1, 3d_{yz}^1, 3d_{xz}^1$**

\* **The value of the ‘spin only’ magnetic moment for one of the following configuration is 2.83 BM. The correct one is**

- (a)  $d^5$  (in strong ligand field)                      (b)  $d^3$  (in weak as well as in strong fields)  
(c)  $d^4$  (in weak ligand fields)                      (d)  $d^4$  (in strong ligand fields)

**Ans: (d)  $d^4$  (in strong ligand fields)**

\* **The “spin-only” magnetic moment (in units of Bohr magneton,  $\mu_B$ ) of Ni<sup>2+</sup> in aqueous solution would be (At No. Ni = 28)**

- (a) 6                      (b) 1.73                      (c) 2.84                      (d) 4.90

**Ans: (c) 2.84**

\* **Which complex of Co<sup>2+</sup> will have the weakest crystal field splitting -**

- (a)  $[\text{CoCl}_6]^{4-}$                       (b)  $[\text{Co}(\text{CN})_6]^{4-}$                       (c)  $[\text{Co}(\text{NH}_3)_6]^{2-}$                       (d)  $[\text{Co}(\text{en})_3]^{2+}$

**Ans: (a)  $[\text{CoCl}_6]^{4-}$**

\* **The crystal field stabilization energy (CFSE) is the highest for**

- (a)  $[\text{CoF}_4]^{2-}$                       (b)  $[\text{Co}(\text{NCS})_4]^{2-}$                       (c)  $[\text{Co}(\text{NH}_3)_6]^{3+}$                       (d)  $[\text{CoCl}_4]^{2-}$

**Ans: (c)  $[\text{Co}(\text{NH}_3)_6]^{3+}$**

\* **Which one of the following complexes is an outer orbital complex?**

- (a)  $[\text{Co}(\text{NH}_3)_6]^{3+}$                       (b)  $[\text{Fe}(\text{CN})_6]^{4-}$                       (c)  $[\text{Fe}(\text{CN})_6]^{4-}$                       (d)  $[\text{Ni}(\text{NH}_3)_6]^{2-}$

**Ans: (d)  $[\text{Ni}(\text{NH}_3)_6]^{2-}$**

- \* **The number of isomers possible for octahedral complex  $[\text{CoCl}_2(\text{en})(\text{NH}_3)_2]^+$  is,**  
 (a) Two (b) Three  
 (c) No isomer (d) four isomers

**Ans: (d) four isomers**

- \* **Which of the following sequence is correct regarding field strength of ligands as per spectrochemical series**

- (a)  $\text{SCN}^- < \text{F}^- < \text{CN}^- < \text{CO}$  (b)  $\text{F}^- < \text{SCN}^- < \text{CN}^- < \text{CO}$   
 (c)  $\text{CN}^- < \text{F}^- < \text{CO} < \text{SCN}^-$  (d)  $\text{SCN}^- < \text{CO} < \text{F}^- < \text{CN}^-$

**Ans: (a)  $\text{SCN}^- < \text{F}^- < \text{CN}^- < \text{CO}$**

- \* **Which of the following will be able to show geometrical isomerism ?**

- (a)  $\text{MA}_3\text{B}$  –square planar (b)  $\text{MA}_2\text{B}_2$ -Tetrahedral  
 (c) MABCD-square planar (d) MABCD- Tetrahedral

**Ans: (c) MABCD-square planar**

## POLYMERS

- \* **An example of biopolymer is**

- (a) teflon (b) neoprene (c) nylon-66 (d) DNA

**Ans: (d) DNA**

- \* **In elastomer, intermolecular forces are**

- (a) Strong (b) weak (c) zero (d) None of these

**Ans: (b) weak**

- \* **Natural rubber is a polymer of**

- (a) Butadiene (b) isoprene (c) 2-methylbutadiene (d) hexa-1, 3-diene

**Ans: (b) isoprene**

- \* **-- $[\text{NH}(\text{CH}_2)_6\text{NHCO}(\text{CH}_2)_4\text{CO}]_n$ --is a**

- (a) addition polymer (b) thermosetting polymer  
 (c) homopolymer (d) copolymer

**Ans: (d) copolymer**

- \* **Which of the following is an example of thermosetting polymer?**  
(a) Polythene            (b) PVC                    (c) Neoprene            (d) Bakelite

**Ans: (d) Bakelite**

- \* **A condensation polymer among the following is**  
(a) Dacron                (b) PVC                    (c) polystyrene            (d) teflon

**Ans: (a) Dacron**

- \* **One the basis of mode of formation, polymers can be classified**  
(a) As addition polymers only            (b) as condensation polymers only  
(c) As copolymers                        (d) as addition and condensation polymers

**Ans: (d) as addition and condensation polymers**

- \* **Ebonite is**  
(a) Natural rubber                        (b) synthetic rubber  
(c) Highly vulcanized rubber            (d) polypropene

**Ans: (c) highly vulcanized rubber**

- \* **Which is not a macromolecule?**  
(a) DNA                    (b) Starch                    (c) Palmitate                (d) Insulin

**Ans: (c) Palmitate**

- \* **Which of the following is not an example of addition polymer?**  
(a) Polystyrene            (b) Nylon 6,6                (c) PVC                      (d) Polypropylene

**Ans: (b) Nylon 6,6**

- \* **Low density polythene is prepared by**  
(a) Free radical polymerization  
(b) Cationic polymerization  
(c) Anionic polymerization  
(d) All of the above are correct

**Ans: (a) Free radical polymerization**

- \* **PVC is:**
- (a) Thermoplastic polymer                      (b) compound polymer  
 (c) Thermosetting polymer                      (d) simple polymer

**Ans: (a) thermoplastic polymer**

- \* **The synthetic polymer which resembles natural rubber is**
- (a) Neoprene                      (b) chloroprene                      (c) glyptal                      (d) nylon

**Ans: (a) neoprene**

- \* **For natural polymers PDI is generally**
- (a) 0                      (b) 1                      (c) 100                      (d) 1000

**Ans: (b) 1**

- \* **Nylon 6,6 is polyamide obtained by the reaction of**

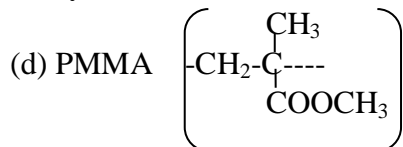
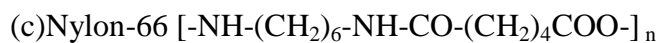
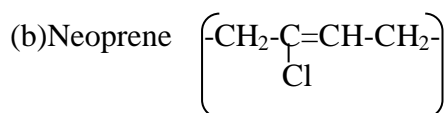
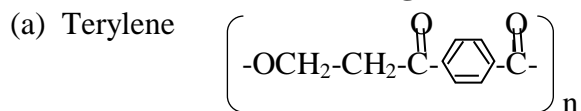
- (a)  $\text{COOH}(\text{CH}_2)_4\text{COOH} + \text{NH}_2\text{C}_6\text{H}_4\text{NH}_2\text{-(p)}$   
 (b)  $\text{COOH}(\text{CH}_2)_4\text{COOH} + \text{NH}_2(\text{CH}_2)_6\text{NH}_2$   
 (c)  $\text{COOH}(\text{CH}_2)_6\text{COOH} + \text{NH}_2(\text{CH}_2)_4\text{NH}_2$   
 (d)  $\text{COOHC}_6\text{H}_4\text{COOH-(p)} + \text{NH}_2(\text{CH}_2)_6\text{NH}_2$

**Ans: (b)  $\text{COOH}(\text{CH}_2)_4\text{COOH} + \text{NH}_2(\text{CH}_2)_6\text{NH}_2$**

- \*  **$\text{CF}_2 = \text{CF}_2$  is a unit of**
- (a) teflon                      (b) Buna - S                      (c) bakelite                      (d) polythene

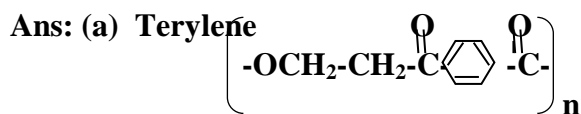
**Ans: (a) teflon**

- \* **Which of the following is not correctly matched?**





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\* **P.V.C. is a polymer of**

- (a) ethene      (b) 1-chloropropene      (c) propene      (d) 1-chloroethene

Ans: (d) 1-chloroethene

\* **Caprolactum polymerises to give**

- (a) terylene      (b) teflon      (c) glyptal      (d) nylon-6

Ans: (d) nylon-6

\* **The process of involving heating of rubber with sulphur is called**

- (a) galvanisation      (b) vulcanization      (c) bessemerisaion      (d) sulphonation

Ans: (b) vulcanization

\* **Which of the following polymers do not involve cross linkages?**

- (a) Melmac      (b) Bakelite      (c) Polythene      (d) Vulcanised rubber

Ans: (c) Polythene

\* **Isoprene is valuable substance for making**

- (a) Propene      (b) liquid fuel      (c) synthetic rubber      (d) petrol

Ans: (c) synthetic rubber

\* **The polymer used in making synthetic hair wigs is made up of**

- (a)  $\text{CH}_2=\text{CHCl}$       (b)  $\text{CH}_2 = \text{CHCOOCH}_3$   
(c)  $\text{C}_6\text{H}_5\text{CH}=\text{CH}_2$       (d)  $\text{CH}_2 = \text{CH}-\text{CH}=\text{CH}_2$

Ans: (a)  $\text{CH}_2=\text{CHCl}$

- \* **Which of the following is polyamide?**  
(a) Nylon 6,6            (b) Terylene            (c) Polythene            (d) BuNa-S

**Ans: (a) Nylon 6,6**

- \* **Orlon has monomeric unit**  
(a) Acrolein            (b) Glycol            (c) Vinyl cyanide            (d) Isoprene

**Ans: (c) Vinyl cyanide**

- \* **Terylene is NOT a**  
(a) Polyester fibre            (b) Step growth polymer  
(c) Copolymer            (d) chain growth polymer

**Ans: (d) chain growth polymer**

- \* **Glycogen is**  
(a) A polymer of  $\beta$ -D-Glucose units  
(b) A structural polysaccharide  
(c) Structurally very much similar to amylopectin  
(d) Structurally similar to amylopectin but extensively branched
- Ans: (d) Structurally similar to amylopectin but extensively branched**

- \* **In BuNa-S, the symbol Bu stands for**  
(a) 1-butene            (b) n-butene            (c) 2-butene            (d) butadiene

**Ans: (d) butadiene**