Solutions

**ALVA’S PRE UNIVERSITY COLLEGE, MOODBIDRI**

**Department of Chemistry**

**CET / NEET Crash Course 2019 – 2020**

**Topics- d and f block elements, coordination compounds-C17**

1. Ans- 3
2. Ans- 1. There is the formation of oxide layer Cr2O3 on Cr.
3. Ans- 2
4. Ans- 4

[Cu(H2O)4]2+SO4 2-+ 4NH3 ----🡪 [Cu(NH3)4]2+ +4H2O

NH3 being stronger ligand than H2O replaces H2O and forms a stable deep blue coloured complex with Cu2+

1. Ans 2

NO 🡪 NO+

Fe2+ +e- 🡪 Fe+

24e- 25e-

Fe2+ +5H2O +NO+

25+5x2+1x2=37e-

1. Ans- 1

Ti3+ is[Ar]4s03d1

Number of unpaired electron =1

1. Ans: 1, V2+=3 up e-, Cr2+= 4 up e-, Mn2+= 5 up e-, Fe2+ = 4 up e-.Hence the order of paramagnetism should be V2+< Cr2+ = Fe2+ < Mn2+
2. Ans:2, in MnO4-,Mn is in +7 OS and in CrO2Cl2 , Cr in +6 OS
3. Ans: 2
4. Ans:1, Ti(IV) has no electron in 3d orbital, no d-d transition is possible, therefore MCl4 is colourless, in M(H2O)6]3+ there is one electron in 3d orbital and its d-d transition is responsible for colour.
5. Ans:3, Ti exhibits +2,+3 and +4 oxidation states but +6 is not present.
6. Ans:3, due to charge transfer spectra
7. Ans:2, both V4+ and Cu+ have one electron in the d-orbital
8. Ans: 3 , since oxalate is a bidentate ligand, it forms the stable complex. Rings provide greater stability to complex (chelate effect)
9. Ans: 2, ∆t = 4/9 ∆o =4/9 x 27= 12 kJ/mol
10. Ans: 4, smaller the value of dissociation constant more is the stability.
11. Ans: 2
12. Ans: 4, Since ∆o > P, pairing takes place thus . Thus hybridization is d2sp3.

[M(AA)3] type shows optical isomerism.

1. Ans: 2
2. Ans: 2,NH4+  has no lone pair of electrons to donate.
3. Ans:4 EAN = Z - Ox. State + (2x co. number)

=45-3+12= 54

1. Ans: 1, here SO42- is acting as monodentate ligand
2. Ans: 2 it is in the form [Cu(H2O)4]SO4.H2O
3. Ans- 1
4. Ans: 3, only Cr has electrons in d orbitals
5. Ans: 2 Cr is in 0 ox. State. As CO, a strong ligand approaches all electrons pair up. Thus mag. Moment = 0
6. Ans: 4, electronic configuration of d6 in low spin = t2g6 eg0

CFSE = (-0.4x + 0.6y) ∆o

= ( -x + y ) ∆o here x=6 y=0

=( -x 6 ) + 0 ∆o

No of electrons pairs= 3, Thus pairing energy = 3P

Therefore energy of low spin d6 cation =

1. Ans: 4, smaller the value of dissociation constant more is the stability.
2. Ans: 2, ∆t = 4/9 ∆o =4/9 x 27= 12 kJ/mol
3. Ans: 4, for symmetrical filing i.e., t2g 3 eg2 , five 3d electrons are required(3d5).

In [CoF6]3- --------------Co3+--3d6

[Co(NH3)6]3+ ---------------- Co3+--3d6

[Mn(CN)6]4- ---------------Mn2+---3d5-----CN- is a strong field ligand---- t2g 5 eg0

[FeF6]3-------------------------Fe3+-------3d5-----F- is a weak field fligand ---- t2g 3 eg2

1. Ans: 3 , since oxalate is a bidentate ligand, it forms the stable complex. Rings provide greater stability to complex (chelate effect)
2. Ans. 2
3. Ans:3,
4. Ans:3, BM, where n is the number of unpaired electron

1.73V4+ = 3d1

1. Ans:2
2. Ans- 4
3. Ans- 3

Fe2O3.H2O forms soluble complex with oxalic acid [Fe(C2O4)3]3-

1. Ans- 4
2. Ans- 3
3. Ans- 3
4. Ans- 3

[Pt (NH3)5Cl]Cl3

1. Ans-3
2. Ans- 2.
3. Ans- 2
4. Ans- 3

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