INORGANIC CHEMISTRY (Important Questions)

C.B.S.E. -XII

1. Write the complete chemical equation for : (i) oxidation of Fe^{+2} by $Cr_2O_7^{-2}$ in acid medium.

(ii) Oxidation of $S_2O_7^{-2}$ by MnO_4^- in neutral aqueous medium.

2. Complete the following chemical reaction:

$F_2 + H_2O \longrightarrow$

$Ca_3P_2 + H_2O \longrightarrow$

$XeF_4 + H_2O \longrightarrow$

3. Assign a reason for each of the following statement.

(a) Phosphorous (P_4) is more reactive than nitrogen (N_2).

(b) All the bonds in PCl_5 are not equal in length

(c) Sulphur in Vapour state exhibits Paramagnetism.

4. (a) Describe the commercial preparation of Potassium permnagenate.

(b) Write ionic equation to represent the reaction of acidified KMnO4 solution with oxalic acid.

5. Account for the following:

(a) Transition metals are well known to form complex compounds.

6. State briefly the Principles which serve as basis for the following operations in the metallurgy.

(a) Froth Floatation process (b) zone refining (c) Hydrollic washing (d) vapour Phas refining.

7. Write chemical reaction for the following process

(a) Chlorine reacts with not concentrated solution solution of NaOH

(b) H3PO3 acid is heated (c) PtF_6 and xenonare mixed together.

8. Assign reasons for the following:

(a) The enthalpies of atomization of transitionelements are high.

(b) The transition metals and many of their compounds act as good catalyst.

(c) The element to element the actionoid contraction is greater than the lanthanoid contraction.

(d) The Eº value for the M_n^{+3}/M_n^{+2} couple is much more positive than that for Cr^{+3}/Cr^{+2}.

(e) Scandium (z = 21) does not exhibit Variable oxidation states and yet it is regarded as transition element.

9. How would you account for the following situations:

(a) The transition metals generally form coloured compounds

(b) With $3d^4$ configuration Cr^{+2} acts as a reducing agent but Mn^{+3} acts as oxidizing agent.

(c) The actinoids exhibit a larger number of oxidation states than corresponding lanthanoids.

10. Write the IUPAC:

$[CoCl(NO_2)(NH_3)_4]Cl$, $[CoF_6]^{3-}$, $[Cr(NH_3)_2(en)_2]Cl_3$, $[Co(NH_3)_6][Cr(CN)_6]$.

11. Using tha valence bond approach deduce the shape and magnetic character of : $[Co(NH_3)_6]^{+3}$ ion

12. (a) Arrange $HClO_3$, $HClO_2$, HOCl and $HClO_4$ in order of increasing acid strength. Give reason for your answer

(b) Give one use of ClF_3

(c) How are the following compounds prepared from XeF_6?

13. Complete the following chemical reactions:

(a) $P_4 + NaOH + H_2O \longrightarrow$ (b) $I^- + H_2O + O_3 \longrightarrow$

(aq).

14. Account for the following:

(a) NH3 is a stronger base than PH_3.

(b) Sulphur has a greater tendency for Catenation than oxygen.

(c) Bond dissociation energy of F_2 is less than that of Cl_2.

15. Complete the following chemical equation for reactions:-

(a) $MnO_4^- + S_2O_3^{-2} + H_2O \longrightarrow$

(b) $Cr_2O_7^{-2} + H_2S + H^+ \longrightarrow$

(c) $MnO\text{-}_4 + C_2O_4^{-2} + H^+ \longrightarrow$

(d) $Cr_2O_7^{-2} + Fe^{+2} + H^+ \longrightarrow$

(e) $Cr_2O_7^{-2} + I + H^+ \longrightarrow$

(f) $MnO_4^- + Fe^{+2} + H^+ \longrightarrow$

(g) $PH_3 + HgCl_2 \longrightarrow$

16. Giving a suitable example for each. Explain following:

(a) Crystal field splitting (b) linkage isomerism (c) Ambident ligands (d) Chelation

17. Compare the following complexes with respect to structural shapes of units, magnetic behavior and hybrid orbitals involved in units .

$[Co(NH_3)_6]^{+3}$, $[Cr(NH_3)_6]^{+3}$, $[Ni(CO)_4]$

18. How would you account for the following observations.

(a) Phosphorus has a greater tendency for Catenation than nitrogen.

(b) No chemical compound of helium known.

(c) Nitrogen does not form pentahalides.

(d) IN aqueous solution HI is a stronger acid.