INDIAN SCHOOL NIZWA - WORKSHEET

CHEMISTRY

CH: 4 d & f block elements

Name:_____ Date:_____ Class:XII Sec: ____

I Give reasons for the following.

1. Cu^{+} ion is colourless while Cupric ion Cu^{2+} is blue in colour in aqueous solutions.
2. Of the d^4 species Cr(II) is strongly reducing while Mn(III) is strongly oxidising.
3. Ionic radius of Cu^{2+} is less than Cr^{2+} while atomic radius of Cu is greater than that of Cr.
4. E^0 for Mn^{3+}/Mn^{2+} couple is more positive than that of Cr^{3+} / Cr.
5. Among the lanthanides, Ce(III) can be easily oxidised to Ce (IV).
6. Zirconium and Hafnium occur together in minerals.
7. Eu^{2+} is strong reducing agent.

Answer the following

1. Calculate the magnetic moment of Fe^{3+} & Ce^{3+} ions.
2. Decide giving reasons which one of the following pairs has the property mentioned.
   i) Fe or Cu , which has the highest melting point?
   ii) Which one exhibits more number of oxidation states, V or Mn?
   iii) Which is paramagnetic,Sc^{3+} or Cr^{3+} ?
3. What is Misch metal? Give its use.
4. Cu^{+} ion is unstable in aqueous solution. Why?
5. Complete and balance the following reaction.
   A) $MnO_4^{2-} + H^{+} \rightarrow$
   B) $MnO_4^{-} + C_2O_4^{2-} + H^{+} \rightarrow$
   C) $MnO_4^{-} + H^{+} + NO_2^{-} \rightarrow$
6. What is Lanthanoid contraction? Give its consequences?
7. When MnO2 is fused with KOH in the presence of KNO3 as an oxidizing agent, it gives a dark green compound (*A*). Compound (A) disproportionates in acidic solution to give purple compound (B). An alkaline solution of compound (B) oxidises KI to compound (C) whereas an acidified solution of compound B oxidises to (D). Identify A,B,C,D.

8. When chromite ore $FeCr_2O_4$ is fused with NaOH in presence of air, a yellow coloured compound (*X*) is obtained which on acidification with dilute sulphuric acid gives a compound (Y). Compound (Y) on reaction with KCl forms an orange coloured crystalline compound (Z). (A) Write the formulae of the compounds (X), (Y) and (Z).

(B) Write one use of compound (Z).

III. Assertion- Reason Questions

1. Assertion: Transition metals show very low degree of para magnetism.

Reason: Transition metal atoms have large number of unpaired electrons.

2. Assertion. Among the 3d series only copper shows +1 oxidation state.

Reason: Cu^+ ion has high negative hydration enthalpy in solution compared to Cu

3. Assertion: Transition metals have high enthalpy of atomisation.

Reason: d-block elements have strong metallic bonds.

4. Assertion: Fe^{2+} readily oxidises to Fe^{3+} in solution.

Reason: Fe^{3+} has a stable d^5 configuration.

5. Assertion: Zn is not regarded as a transition metal.

Reason: In Zn ,3d orbitals are completely filled in its ground state as well as in its oxidized state.