



I Give reasons for the following.

1. Transition metal ions form complexes.
2. There is no regular trend in the E^0 values in the transition series.
3. Zirconium and Hafnium occur together in mineral.
4. Many transition metals have catalytic properties.
5. Highest oxidation state of transition metals is shown only in oxides and fluorides.
6. Among the lanthanides, Ce(III) can be easily oxidised to Ce (IV).
7. Cu^+ ion is colourless while Cupric ion Cu^{2+} is blue in colour in aqueous solutions.
8. Of the d^4 species Cr(II) is strongly reducing while Mn(III) is strongly oxidising.
9. The IE_1 of the 5d transition metals is higher than those of 3d and 4d metals.
10. Ionic radius of Cu^{2+} is less than Cr^{2+} while atomic radius of Cu is greater than that of Cr.
11. E^0 for $\text{Mn}^{3+}/\text{Mn}^{2+}$ couple is more positive than that of Cr^{3+}/Cr .
12. HCl is not used for acidifying solution used for permanganometric titrations.

II Answer the following

1. Calculate the magnetic moment of Fe^{3+} & Ce^{3+} ions.
2. Draw the structures of chromate and dichromate ions.
3. Explain with equations, how the colour of a solution of $\text{K}_2\text{Cr}_2\text{O}_7$ depends on pH
4. Decide giving reasons which one of the following pairs has the property mentioned.
 - a. Sc^{3+} or Cr^{3+} exhibits paramagnetism.
 - b. V or Mn exhibits more number of oxidation states.
 - c. Fe or Cu has the highest melting point.