



Assignment

- Q1. What are the transition elements? Write two characteristics of the transition elements?
- Q2. Why Zn is not considered as a transition element?
- Q3. On what ground can you say that scandium ($Z = 21$) is a transition element but zinc ($Z = 30$) is not?
- Q4. Why transition metals form coloured compounds?
- Q5. Why do transition elements show variable oxidation states?
- Q6. Explain briefly why Copper (I) ion is not known in aqueous solution?
- Q7. Explain giving reasons that transition metals and their compounds generally exhibit a paramagnetic behaviour?
- Q8. Why Cd^{2+} salts are white?
- Q9. Give reason for the observation that orange solution of potassium dichromate turns yellow on adding sodium hydroxide to it?
- Q10. Account for the following that Zr ($Z = 40$) and Hf ($Z = 72$) have almost similar atomic radii?
- Q11. Name a member of the lanthanoid series which is well known to exhibit +2 oxidation state?
- Q12. Name a member of the lanthanoid series which is well known to exhibit +4 oxidation state?
- Q13. What are the different oxidation states exhibited by the lanthanoids?
- Q14. How would you account for the following that among lanthanoids, Ln (III) compounds are predominant. However, occasionally in solutions or in solid compounds, +2 and +4 ions are also obtained.
- Q15. Give reason for the observation that there is a gradual decrease in the size of atoms with increasing atomic number in the series of Lanthanoids
- Q16. What is meant by 'lanthanoid contraction'?
- Q17. What are different oxidation states exhibited by lanthanoids?
- Q18. Explain the following observations that La^{3+} ($Z = 57$) and Lu^{3+} ($Z = 71$) do not show any colour in solutions?
- Q19. Give reason for the following that among the Lanthanoids, Ce (III) is easily oxidised to Ce (IV).
- Q20. Give reason for the following that the second and third transition series elements have almost similar atomic radii.
- Q21. Assign a reason for each of the following observations :
- Mn shows the highest oxidation state of +7 with oxygen but with fluorine it shows the highest oxidation state of +4.
 - Transition metals and their compounds show catalytic properties.



Myetutors.com

JEE (Mains) | NEET | CBSE | ICSE

Assignment

- (iii) Mn^{2+} is more stable than Fe^{2+} towards oxidation to +3 state.
- (iv) The enthalpy of atomization is lowest for Zn in 3d series of the transition elements.
- (v) Which of the 3d-block elements may not be regarded as the transition elements and why?
- (vi) The transition metals (with the exception of Zn, Cd and Hg) are hard and have high melting and boiling points.
- (vii) The ionisation enthalpies (first and second) in the first series of the transition elements are found to vary irregularly
- (viii) Cobalt (II) is very stable in aqueous solutions but gets easily oxidised in the presence of strong ligand
- (ix) Transition metals are much harder than the alkali metals.
- (x) Which of following cations are coloured in aqueous solutions and why? Sc^{3+} , V^{3+} , Ti^{4+} , Mn^{2+} (At. Nos. Sc = 21, V = 23, Ti = 22, Mn = 25)
- (xi) Many of the transition elements are known to form interstitial compounds.
- (xii) The metallic radii of the third (5d) series of transition metals are virtually the same as those of the corresponding group member of the second (4d) series.
- (xiii) With the same *d*-orbital configuration (d^4) Cr^{2+} is a reducing agent while Mn^{3+} is an oxidising agent.
- (xiv) Most of the transition metal ions exhibit characteristic colours in aqueous solutions.
- (xv) The $E^\circ_{\text{M}^{2+}/\text{M}}$ for copper is positive (+0.34 V). Copper is the only metal in the first series of transition elements showing this behaviour.
- (xvi) The enthalpies of atomization of transition metals are quite high.
- (xvii) The Fe^{2+} is much more easily oxidised to Fe^{3+} than Mn^{2+} to Mn^{3+} .
- (xviii) How is the variability in oxidation states of transition elements different from that of non-transition elements? Illustrate with example
- (xix) The lowest oxide of a transition metal is basic, the highest is amphoteric/acidic.
- (xx) Transition elements are known to form many interstitial compounds.
- (xxi) The E° value for $\text{Mn}^{3+}/\text{Mn}^{2+}$ couple is much more positive than for $\text{Cr}^{3+}/\text{Cr}^{2+}$ or $\text{Fe}^{3+}/\text{Fe}^{2+}$ couple.
- (xxii) Mn(II) ion shows maximum paramagnetic character amongst the bivalent ions of first transition series?
- (xxiii) Scandium (At. no. 21) salts are white?