

Board – CBSE

Class – 12<sup>th</sup>

Topic – d- and f-Block Elements

1. Describe the steps of preparation of  $\text{KMnO}_4$ .
2. What happens when (a) A lanthanide reacts with dil- acid (b) A lanthanide reacts with water.
3. What is the lanthanide contraction? What are its causes and consequences?
4. Explain the steps of preparation of potassium dichromate?
5. Transition metals generally form colored ions. Why? Which of the following will be colored?  
 $\text{Sc}^{+3}$ ,  $\text{V}^{+2}$ ,  $\text{Mn}^{+2}$ ,  $\text{Cu}^+$ ,  $\text{Ni}^{+2}$
6. Give reasons- Second ionization is difficult from Cu and Cr whereas it is easy for Zn.
7. Silver atom has completely filled d orbitals ( $4d^{10}$ ) in its ground state. How can you say that it is a transition element?
8. Which of the 3d series of the transition metals exhibits the largest number of oxidation states and why?
9. How would you account for the irregular variation of ionization enthalpies (first and second) in the first series of the transition elements?
10. Why is the highest oxidation state of a metal exhibited in its oxide or fluoride only?
11. Explain why  $\text{Cu}^+$  ion is not stable in aqueous solutions?
12. Actinoid contraction is greater from element to element than lanthanide contraction. Why?
13. Write down the electronic configuration of:  
(a)  $\text{Cr}^{+3}$                       (b)  $\text{Cu}^+$                       (c)  $\text{Co}^{+2}$                       (d)  $\text{Ce}^{+4}$
14. Explain briefly how +2 state becomes more and more stable in the first half of the first row transition elements with increasing atomic number?
15. To what extent do the electronic configurations decide the stability of oxidation states in the first series of the transition elements? Illustrate your answer with examples.
16. Name the oxometal anions of the first series of the transition metals in which the metal exhibits the oxidation state equal to its group number.
17. Describe the preparation of potassium dichromate from iron chromite ore. What is the effect of increasing pH on a solution of potassium dichromate?
18. In what way is the electronic configuration of the transition elements different from that of the non-transition elements?
19. Explain giving reason: Transition metals and their many compounds act as good catalyst
20. How is the variability in oxidation states of transition metals different from that of the non-transition metals? Illustrate with examples.