Chemistry Worksheets Class 12 on Chapter 8: The d & f Block Elements – Set 1

Q1. The element of the first transition series which shows the maximum number of oxidation state is-

a.) Mn
b.) Cr
c.) Fe
d.) Cu

Q2. Which is colourless in H_2O?

a.) Ti^{3+}
b.) V^{3+}
c.) Cr^{3+}
d.) Sc^{3+}

Q3. Which of the following is not an actinoid?

a.) Cerium
b.) Californium
c.) Uranium
d.) Terbium

Q4. Misch metal is an alloy of-

a.) La
b.) Th
c.) Ac
d.) None of these

Q5. During oxidation in an alkaline medium using $KMnO_4$, the oxidation number of manganese changes from-

a.) +7 to +2
b.) +2 to +7
c.) +7 to +4
d.) +7 to +5

Q6. Ions of Zn^{2+} and Ti^{4+} are colourless while Cu^{2+} and Ni^{2+} are coloured. Why?

Q7. Why are ionisation energies of 5d elements greater than 3d elements?

Q8. In the transition series, starting from lanthanum (Z= 57), the next element Hf has atomic number 2. Why do we observe this jump in atomic number?

Q9. What are transition elements? Which of the d-block elements are not regarded as transition elements?

Q10. What is lanthanoid contraction? What is the cause of it?

Q11. Name the following:
(i) Divalent ion of first transition series having a maximum magnetic moment.
(ii) Coloured ions of Cu^{+} and Cu^{2+}.
(iii) Two ions of the first transition series having zero magnetic moment.

Q12. Silver is a transition metal but zinc is not. Why?

Q13. The chemistry of all lanthanoids is so identical. Explain.

Q14. What happens when-
(a) A lanthanoid reacts with dilute acid.
(b) A lanthanoid reacts with water.

Q15. Explain the following observations giving an appropriate reason for each-
(i) The enthalpies of atomisation of transition elements are quite high.
(ii) There occurs much more frequent metal-metal bonding in compounds of heavy transition metals (i.e. 3rd series).
(iii) Mn^{2+} is much more resistant than Fe^{2+} towards oxidation.

Q16. Write the chemical equation for the following-
(i) Oxidation of Fe^{2+} by $Cr_2O_7^{2-}$ in an acidic medium.
(ii) Oxidation of $S_2O_3^{2-}$ by MnO_4^{-} in alkaline medium.
(iii) Oxidation of I^{-} by MnO_4^{-} in alkaline medium.
(iv) Oxidation of SO_3^{2-} by $Cr_2O_7^{2-}$ in an acidic medium.
(v) Oxidation of sulphur dioxide by MnO_4^{-} in acidic medium.

Q17. The following two reactions of HNO_3 with Zn are given:
(a) $Zn + \text{conc. } HNO_3 \rightarrow Zn(NO_3)_2 + X + H_2O$
(b) $Zn + \text{dil. } HNO_3 \rightarrow Zn(NO_3)_2 + Y + H_2O$
Identify X and Y and write balanced equations.

Q18. Account for the following:
(a) Transition metals and the majority of their compound acts as a good catalysts.

(b) From element to element, actinoid contraction is greater than lanthanoid contraction.

Q19. Explain the steps of preparation of potassium dichromate?

Q20. Compare the chemistry of actinoids with that of lanthanoids with special reference to:
(a) electronic configuration
(b) oxidation state
(c) atomic and ionic sizes
(d) chemical reactivity