CBSE NCERT Based Chapter wise Questions (2025-2026)

Class-XII

Subject: CHEMISTRY

Chapter Name : 'd' & 'f' block elements

Total : 5 Marks (expected) [MCQ(1)-1 Mark, VSA-(2)-1 Marks, LA(1)-3 Marks]

Level - 1

(I) MCQ Type : (Once Correct Answer)

1. Transition metals are known to make interstitial compounds. Formation of interstitial compounds makes the transition metals.

Ⓐ more hard Ⓑ more soft Ⓒ more ductile Ⓓ more metallic

(Hints : CBSE 2024)

2. When the following ions has the electronic configuration $3d^6$?

(Atomic number : Mn = 25, Co = 27, Ni = 28)

Ⓐ Ni^{3+} Ⓑ Co^{3+} Ⓒ Mn^{2+} Ⓓ Mn^{3+}

(Hints : CBSE 2023)

3. Which property of transition metals enables them to behave as catalysts ?

Ⓐ High melting point Ⓑ High unization enthalpy

Ⓒ Alloy formation Ⓓ Variable oxidation

(Hints : CBSE 2023)

4. Which set of coins exhibit specific colours?

(Atomic number of Sc = 21; Ti = 22, V = 23, Mn = 25, Fe = 26, Ni = 28, Cu = 29 .... & Zn = 30)

Ⓐ Sc^{3+}, Ti^{4+}, Mn^{3+} Ⓑ Sc^{3+}, Zn^{2+}, Ni^{2+} Ⓒ V^{3+}, V^{2+}, Fe^{3+} Ⓓ Ti^{3+}, ti^{4+}, Ni^{2+}

(Hints : CBSE 2021 SOP)

5. Which of the following is the reason for zinc not exhibiting variable oxidation state ?

Ⓐ inert pair effect Ⓑ completely filled 3d shell

Ⓒ completely filled 4s subshell Ⓓ common in effect

(Hints : CBSE 2021 SOP)

(II) Very Short Answer (VSA) : [1 Mark each]

6. Out of zinc and tin whose coating is better to protect iron objects ?

(Hints : CBSE 2020, Set 56/1/1)

7. Write the formula of an oxo-anion of Manganese (Mn) in which it shows the oxidation state equal to group number.

(Hints : CBSE 2020, DELHI)

8. Write the formula of an oxo-anion of Chromium (Cr) in which it shows the oxidation state equal to its group number.

(Hints : CBSE 2017, DELHI)

Long Answer Question (LA) :

9. (i) Why are fluorides of transition metals more stable in their higher oxidation state as compared to the lower oxidation states ?

(ii) Which one of the following would feel attraction when placed in magnetic field :

Cu^{2+}, Ag^{+}, Ti^{4+}, Zn^{2+}

(Hints : CBSE, SQP TERM-II, 2022)

10. Account for the following :

(i) Ti (IV) is more stable than Ti (II) or Ti (III).

(ii) In case of transition elements, ions of the same charge in a given series show progression decrease in radius with increasing atom.

(iii) Zinc is a comparatively a soft metal, Iron and Chromium are typically hard.

(Hints : CBSE, SQP TERM-II, 2022)

11. Give reasons form the following :

(i) Transition elements act as catalyst.

(ii) It is difficult to obtain oxidation state greater than two for Cu.

(iii) CrO is basic but Cr_2O_3 is amphoteric)

(Hints : (Hints : CBSE 2021 SQP)

12. Give reasons for the following :

(a) Transition metals form complex compounds.

(b) E° values for (Zn^{2+}/Zn) and (Mn^{2+}/Mn) are more negative than expected.

(c) Actinides show wide range of oxidation states :

(Hints : CBSE 2019, 56/2/1)

13. Give reasons for the following :

(a) Transition elements and their compounds are colour.

(b) E° value for (Mn^{2+}/Mn) is negative whereas for (Cu^{2+}/Cu) is positive.

(c) Actinides show irregularities in their isoelectronic configuration.

(Hints : CBSE 2019, 56/1/1)

ANSWER

1. Ⓐ
2. Ⓑ
3. Ⓓ
4. Ⓒ
5. Ⓑ
6. Zn.
7. $MnO_4^{\ominus}$, Mn is + 7 $\Rightarrow$ group number 7.
8. $Cr_2O_7^{2-}$; Oxidation State = +6, = its group no. 6.