



Class 12 Chemistry | The D- And F-Block Elements

MCQ WORKSHEET • 15 questions • Choose one correct option • Suggested time: 25 minutes

1. Which atom has ground-state configuration $[\text{Ar}]3d^54s^1$?

A. Mn B. Cr C. Cu D. Fe

2. Which ion is colourless due to a d^0 configuration?

A. V^{3+} B. Ti^{3+} C. Sc^{3+} D. Cr^{3+}

3. Which ion has a d^{10} configuration?

A. Fe^{2+} B. Zn^{2+} C. Co^{2+} D. Mn^{2+}

4. Why is Zn not a transition element by the usual definition?

A. It has no d electrons
B. It belongs to the p block
C. Atom and common ion have full d shells
D. It is not metallic

5. The most common oxidation state of lanthanoids is:

A. +6 B. +1 C. +3 D. +2

6. Lanthanoid contraction mainly results from:

A. Excellent shielding by 4f electrons
B. Decreasing nuclear charge
C. Removal of all f electrons
D. Poor shielding by 4f electrons

7. Similarity of Zr and Hf radii is mainly due to:

A. Lanthanoid contraction
B. Hydrogen bonding
C. Same atomic mass
D. Same neutron number

8. Number of unpaired electrons in high-spin Mn^{2+} is:

A. 4 B. 3 C. 0 D. 5

9. Spin-only magnetic moment for two unpaired electrons is approximately:

A. 4.90 BM B. 1.73 BM C. 2.83 BM D. 3.87 BM

10. Transition metals show variable oxidation states because:

A. Their nuclei change
B. Only s electrons can bond
C. ns and (n-1)d energies are similar
D. All d orbitals are filled

11. In acid, MnO_4^- is reduced mainly to:

A. MnO_4^{2-} B. MnO_2 C. Mn^{2+} D. Mn metal

12. Colour of aqueous dichromate is:

A. Colourless B. Green C. Purple D. Orange

13. Adding alkali to dichromate shifts equilibrium toward:

A. Yellow chromate
B. Green Cr^{3+} directly
C. Colourless chromium metal
D. Purple permanganate

14. Interstitial compounds are formed when small atoms occupy:

A. Nuclei of metal atoms
B. Only surface vacancies
C. Only outer s orbitals
D. Voids in metal lattices

15. Actinoids show more variable oxidation states than lanthanoids mainly because:

A. Only 7s electrons exist
B. All 5f orbitals are empty
C. 5f, 6d, 7s energies are comparable
D. They have no shielding

ANSWER KEY — check after completing all 15 questions

1.B 2.C 3.B 4.C 5.C 6.D 7.A 8.D 9.C 10.C 11.C 12.D 13.A 14.D 15.C

Original exam-style practice • Reference notes: www.physics.guru/cbse-practice-papers/ • Not an official paper

Plot No. 15, Second Floor, Jaisingh Chowk, Sector 85, Gurgaon - 122004

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