

## d- Block Elements

### Assertion- Reason type

- (i) Assertion and reason both are correct and reason is correct explanation of assertion.
- (ii) Assertion and reason both are wrong statements.
- (iii) Assertion is correct statement but reason is wrong statement.
- (iv) Assertion is wrong statement but reason is correct statement.
- (v) Both assertion and reason are correct statements but reason is not correct explanation of assertion.

1. **Assertion** :  $\text{Cu}^{2+}$  iodide is not known.

**Reason** :  $\text{Cu}^{2+}$  oxidises  $\text{I}^-$  to iodine.

2. **Assertion** : Separation of Zr and Hf is difficult.

**Reason** : Because Zr and Hf lie in the same group of the periodic table.

3. **Assertion** : Cu cannot liberate hydrogen from acids.

**Reason** : Because it has positive electrode potential.

4. **Assertion** : The highest oxidation state of osmium is +8.

**Reason** : Osmium is a 5d-block element.

5. **Assertion**: Zn is considered as a transition element.

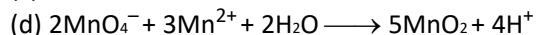
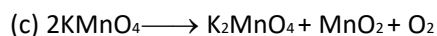
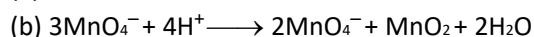
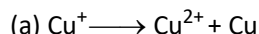
**Reason**: Zn has a fully filled penultimate d-subshell.

### Multiple choice questions

1. Highest oxidation state of manganese in fluoride is +4 ( $\text{MnF}_4$ ) but highest oxidation state in oxides is +7 ( $\text{Mn}_2\text{O}_7$ ) because \_\_\_\_\_.
  - (i) fluorine is more electronegative than oxygen.
  - (ii) fluorine does not possess *d*-orbitals.
  - (iii) fluorine stabilises lower oxidation state.
  - (iv) in covalent compounds fluorine can form single bond only while oxygen forms double bond.
2. The magnetic moment is associated with its spin angular momentum and orbital angular momentum. Spin only magnetic moment value of  $\text{Cr}^{3+}$  ion is \_\_\_\_\_.
  - (i) 2.87 B.M.
  - (ii) 3.87 B.M.
  - (iii) 3.47 B.M.
  - (iv) 3.57 B.M.
3. Interstitial compounds are formed when small atoms are trapped inside the crystal lattice of metals. Which of the following is not the characteristic property of interstitial compounds?
  - (i) They have high melting points in comparison to pure metals.
  - (ii) They are very hard.
  - (iii) They retain metallic conductivity.

(iv) They are chemically very reactive.

4. Which of the following reactions are disproportionation reactions?



(i) a, b

(ii) a, b, c

(iii) b, c, d

(iv) a, d

5. Generally transition elements form coloured salts due to the presence of unpaired electrons. Which of the following compounds will be coloured in solid state?

(i)  $\text{Ag}_2\text{SO}_4$

(ii)  $\text{CuF}_2$

(iii)  $\text{ZnF}_2$

(iv)  $\text{Cu}_2\text{Cl}_2$

6. The electronic configuration of Cu(II) is  $3d^9$  whereas that of Cu(I) is  $3d^{10}$ . Which of the following is correct?

(i) Cu(II) is more stable

(ii) Cu(II) is less stable

(iii) Cu(I) and Cu(II) are equally stable

(iv) Stability of Cu(I) and Cu(II) depends on nature of copper salts

7. Electronic configuration of a transition element X in +3 oxidation state is  $[\text{Ar}]3d^5$ . What is its atomic number?

(i) 25

(ii) 26

(iii) 27

(iv) 24

8. Transition metals, despite high  $E^\circ$  oxidation, are poor reducing agents. The incorrect reason is

(i) high heat of vaporization.

(ii) high ionization energies.

(iii) low heats of hydration.

(iv) complex forming nature.

9. Anomalous electronic configuration in the 3d series are of

(i) Cr and Fe

(ii) Cu and Zn

(iii) Fe and Cu

(iv) Cr and Cu

10. Which one of the following characteristics of the transition metals is associated with higher catalytic activity?

(i) High enthalpy of atomisation

(ii) Paramagnetic behaviour

(iii) Colour of hydrate ions

(iv) Variable oxidation states