

***Sincerity, Nobility and Service***

**WORKSHEET NO.7**

**GRADE: XII DATE: 23.09.19**

**SUBJECT: CHEMISTRY TOPIC: d and f-BLOCK ELEMENTS**

1. Explain:
2. The second and third rows of transition elements resemble each other much more than they resemble the first row.
3. EΘ if Cu is 0.34 V while that of Zn is –o.76 V.
4. Give reasons
5. Actenoids exhibit greater range of oxidation states than Lanthanides.
6. a. Which of the following cations are coloured in aqueous solutions? Why?

 𝑺𝑪 𝟑+, 𝑽 𝟑+, 𝑻𝒊𝟒+, 𝑴𝒏𝟐+(𝐀𝐭. 𝐧𝐨𝐬. 𝐒𝐜 = 𝟐𝟏, 𝐕 = 𝟐𝟑, 𝐓𝐢 = 𝟐𝟐, 𝐌𝐧 = 𝟐𝟓)

1. Following are the transition metal ions of 3d series: 𝐓𝐢𝟒+, 𝐕 𝟐+, 𝐌𝐧𝟑+,𝐂𝐫𝟐+

(Atomic numbers: Ti = 22, V = 23, Mn = 25, Cr = 24)

 Answer the following:

(i) Name the ion which is most stable in an aqueous solution. Why?

(ii) Which ion is a strong oxidising agent? Why?

(iii) Which ion is colourless? Why?

 4. Complete the following equations:

(i) 𝟐𝐌𝐧𝐎𝟒 − + 𝟏𝟔𝐇 + + 𝟓𝐒𝟐− ⟶

(ii) 𝐊𝐌𝐧𝐎𝟒 𝐡𝐞𝐚𝐭 →

(iii) 𝐌𝐧𝐎2 +KOH + O2 ->

(iv) Cr2O72- + OH - ->

(v) 𝑿𝒆𝑭𝟒 + 𝑯𝟐𝑶 ⟶

 (vi) 𝑪𝒓𝟐𝑶𝟕 𝟐− + 𝑯+ + 𝑰 + ⟶

(vii) 𝑴𝒏𝑶𝟒 − + 𝑵𝑶𝟐 − + 𝑯+ ⟶

(viii) Na2CrO4 + H2SO4 ->

5. Account for the following:

1. Transition metals form large number of complex compounds.
2. Lowest oxide of transition metal is baic whereas the highest oxides are amphoteric or acidic.
3. E0 value for the Mn3+/Mn2+ couple is highly positive (+1.57V) as compare to Cr3+/Cr2+
4. Write one similarity and difference between lathanoid and actinoid elements.
5. Transition elements and their compounds are known to act a catalyst.
6. The higher oxidation states are exhibited by the members in the middle of a series of transition elements.
7. The metal-metal bond is more frequently found with the second and third series of transition elements.
8. Transition metals form coloured compounds
9. Actinoids show irregularities in their electronic configuration.
10. Zn2+ salts are white while Cu2+ salts are coloured.
11. There is a gradual increase in the atomic sizes of transition elements in a series with increase in atomic number.
12. Although Zr belongs to 4d and Hf belongs to 5d series but it is quite difficult to separate them.

 6. Why does Mn show maximum number of oxidation states?

7. Orange solution of potassium dichromate turns yellow on adding sodium hydroxide to it. Why?