

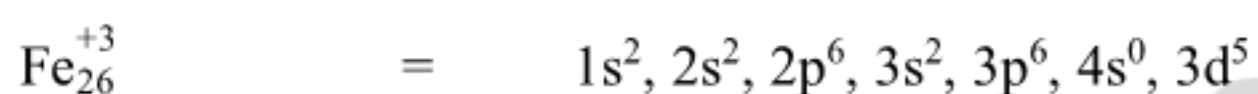
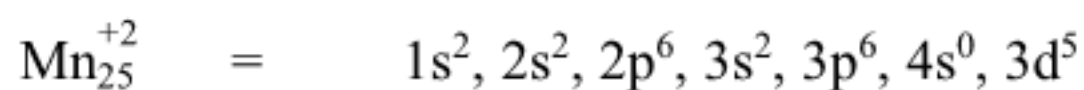
SHORT QUESTIONS

Q.1 Why most of the transition metal ions are coloured?

Ans. Metal ions are coloured due to the excitation of electrons. These ions absorb particular wavelengths of visible light for excitation of electrons. Thus remaining wavelengths are reflected and give some colour.

Q.2 Why some transition metals are paramagnetic in nature?

Ans. Paramagnetic nature of metals and metals ions is due to presence of unpaired electrons present in them. Fe^{+3} and Mn^{+2} have strong paramagnetic behaviour due to the presence of five unpaired electrons in them.



Q.3 What is the trend of melting points in transition series?

Ans. The melting point of metals depends upon the binding force between the bonded atoms. In transition series, the binding force increases upto the middle due to the increase in unpaired electrons and melting point increases upto middle of transition series. The binding force is maximum upto group VI-B and then decreases due to the decrease in no. of unpaired electrons.

Q.4 Differentiate between paramagnetism and diamagnetism.

Ans. The substance which is weakly attracted by the strong magnetic field is called paramagnetic. Paramagnetism is due to the presence of unpaired electrons. The substance which is weakly repelled by the strong magnetic field is called diamagnetic substance. The substance in which all atoms have paired spin are diamagnetic. O_2 is paramagnetic and N_2 is diamagnetic.

Q.5 What is trend in paramagnetic behaviour in the transition series of 4th period?

Ans. The paramagnetic nature of a substance depends upon the number of unpaired electrons. In the transition series, number of unpaired electrons increase upto the middle and then decreases. So the paramagnetic behaviour increases upto the middle and then decreases.

Q.6 How the entrapped air of molten iron is removed?

Ans. The entrapped air in iron is removed by adding small amount of aluminum in it. N_2 and O_2 of air react with Al to form AlN and Al_2O_3 respectively.



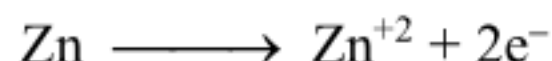
Q.7 What is sacrificial corrosion?

Ans. Less reactive metal (Fe) is protected by coating it with more reactive metal (Zn). If this coating is damaged, a galvanic cell is established in the presence of moisture. Then active

metal (Zn) acts as anode and is oxidized and corroded. Less reactive metal (Fe) remain intact. This is called sacrificial corrosion.

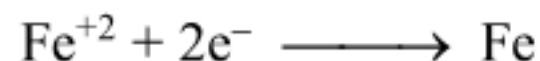
Anode:

(oxidation)



Cathode:

(reduction)

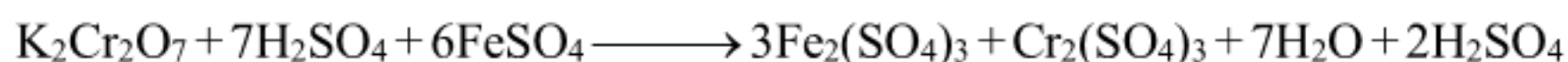


Overall reaction:

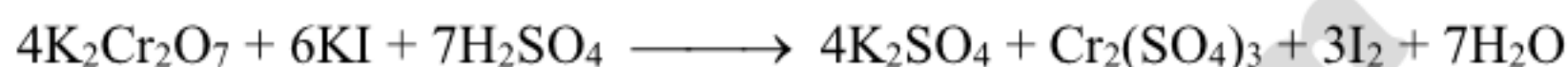


Q.8 $\text{K}_2\text{Cr}_2\text{O}_7$ acts as strong oxidising agent. Support this statement with two equations.

Ans. (i) $\text{K}_2\text{Cr}_2\text{O}_7$ oxidises FeSO_4 to $\text{Fe}_2(\text{SO}_4)_3$ in the presence of H_2SO_4 .

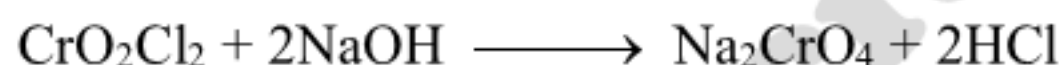


(ii) $\text{K}_2\text{Cr}_2\text{O}_7$ reacts with KI to form I_2 in the presence of H_2SO_4 .

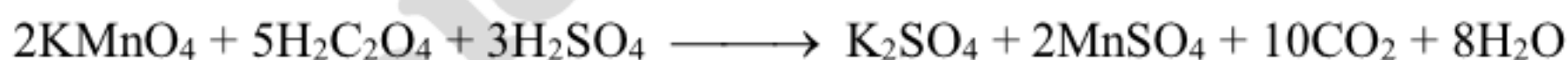


Q.9 What is chromyl chloride test for which radical this test is performed?

Ans. Chromyl chloride test is performed for Cl^- radical. In this test conc. H_2SO_4 is added to solid salt and solid $\text{K}_2\text{Cr}_2\text{O}_7$. An orange coloured gas CrO_2Cl_2 is evolved. This CrO_2Cl_2 is called chromyl chloride gas. It is passed into NaOH and lead acetate is added yellow ppts of PbCrO_4 is formed.



Q.10 “ KMnO_4 is a strong oxidising agent”. Support the statement with two chemical reactions.



Q.11 Define chelate with one example.

Ans. The complex in which two or more different atoms of a polydentate ligands are coordinated with central metal atom or ion and form a ring is called chelate and this process is called chelation.



Q.12 What is difference between mild steel and medium steel?

Ans. (i) The steel in which percentage of C is 0.1 – 0.2% is called mild steel. It is fairly soft, malleable and ductile and can be forged into different shapes.

(ii) The steel which contain 0.2 – 0.7% of carbon in it is called medium steel.

Q.13 What is difference between pig iron and steel?

Ans. The percentage of carbon in pig iron is 2.5 – 4.5% and in steel is 0.25 – 2.5%.

Q.14 Name the following complexes.

Ans. $[\text{Fe}(\text{CO})_5]$	Pentacarbonyl iron (0)
$[\text{Co}(\text{NH}_3)_6]\text{Cl}_3$	Hexa ammine cobalt (III) chloride
$[\text{Fe}(\text{H}_2\text{O})_6]^{+2}$	Hexa aqua iron (II) ion
$\text{Na}_3[\text{CoF}_6]$	Sodium hexa fluoro cobaltate (III)
$\text{K}_2[\text{Cu}(\text{CN})_4]$	Pot-tetra cyano cuprate (II)
$\text{K}_2[\text{PtCl}_6]$	Pot-hexa chloroplatinate (IV)
$[\text{Pt}(\text{OH})_2 (\text{NH}_3)_4]\text{SO}_4$	Tetra ammine dihydroxo platinum (IV) sulphate
$[\text{Cr}(\text{OH})_3 (\text{H}_2\text{O})_3]$	Tri aqua trihydroxo chromium (III)
$[\text{Ag}(\text{NH}_3)_2]\text{Cl}$	Diammine silver (I) chloride
$[\text{Cu}(\text{NH}_3)_4]\text{SO}_4$	Tetra ammine copper (II) sulphate
$\text{K}_4[\text{Fe}(\text{CN})_6]$	Pot-hexa cyano ferrate (II)
$\text{Ni}(\text{CO})_4$	Tetra carbonyl nickel (0)
$[\text{MnCl}_4]^{-2}$	Tetra chloro manganate (II) ion