CHEMISTRY

Redox Reactions

Redox Reactions in Terms of Electron Transfer Reaction

1. (4)
$2Na(s) + H_2(g) \xrightarrow{heat} 2NaH(s)$
With the careful application of the concept of electronegativity, we can find that sodium is oxidised and hydrogen is reduced.
2. (2)
3. (1)
$Sn^{2+} \rightarrow Sn^{4+} + 2e^-$. In this reaction Sn^{2+} change in Sn^{4+} it is called an oxidation reaction.
4. (4)
$\overset{+5}{NO_3^-} \rightarrow \overset{-2}{N_2H_4}$. So, for reduction of 1 mole of NO_3^-, number of electrons required is 7.
5. (3)
$\overset{+2}{Ba}\overset{-1}{O_2} + \overset{+1}{H_2}\overset{+6}{S}\overset{-2}{O_4} \rightarrow \overset{+2}{Ba}\overset{+6}{S}\overset{-2}{O_4} + \overset{+1}{H_2}\overset{-1}{O_2}$
In this reaction, none of the elements undergoes a change in oxidation number or valency.
6. (4)
Reduction potential of Cu(II) is greater than that of Zn(II) and Al(III) thus can be easily replaced by these ions. Moreover, solution of copper is blue in colour.

Classical Idea of Redox Reactions – Oxidation and Reduction Reaction

7. (4)
$2MnO_4^- + 5C_2O_4^{2-} \rightarrow 2Mn^{2+} + 10CO_2$
Balancing O $\rightarrow$ 8 $\rightarrow$ H_2O
$2MnO_4^- + 5C_2O_4 + 16H^+ \rightarrow 2Mn^{2+} + 10CO_2 + 8H_2O$
Balancing $\rightarrow$ H $\rightarrow$ $16H^+$
8. (1)
$2CrO_4^{2-} + 2H^+ \rightarrow CrO_7^{2-} + H_2O$
Here Cr^{2+} is converting into Cr^{+6}
CrO_4^{2-} is a reducing agent
$Cr_2O_7^{2-} \rightarrow Cr$ is in +6 oxidation state
$Cr_2O_7^{2-} \rightarrow$ will act as an oxidising agent
9. (3)
$NO_3^- + 4H^+ + e^- \rightarrow 2H_2O + NO$
Reduction half-reaction
$NO_3^- + 4H^+ + 3e^- \rightarrow 2H_2O + NO$
10. (4)
$8Al + 3Fe_3O_4 \rightarrow 4Al_2O_3 + 9Fe$
Al is reductant, Fe is oxidant
Oxidation number of Al in transition state = 0
Oxidation number of Al in Al_2O_3 = +3
Number of electrons transferred by 8Al atoms = 8 × 3 = 24 electrons