e-Edge Education Centre, www.eeeclasses.info

Time -1 Hr. Subject-Chemistry Class-XI M.M- 24

1. Justify that the reaction : [1]

$2\ Na(s) + H_2(g) \rightarrow 2\ NaH\ (s)$ is a redox change.

2. Given the standard electrode potentials, [1]

$K^+/K = –2.93V$, $Ag^+/Ag = 0.80V$,

$Hg^{2+}/Hg = 0.79V$

$Mg^{2+}/Mg = –2.37V$. $Cr^{3+}/Cr = –0.74V$

arrange these metals in their increasing order of reducing power.

3. Consider the reactions : [1]

(i) $2\ S^2O_3^{2-}\ (aq) + I_2(s) \rightarrow S_4O_6^{2-}\ (aq) + 2I^-(aq)$

(ii) $S_2O_3^{2-}\ (aq) + 2Br_2(l) + 5\ H_2O(l) \rightarrow 2SO_4^{2-}\ (aq) + 4Br^-(aq) + 10H^+(aq)$

4. Identify the substance oxidised reduced, oxidising agent and reducing agent for each of the following reactions: [2]

(i) $HCHO(l) + 2[Ag\ (NH_3)_2]+(aq) + 3OH^-(aq) \rightarrow 2Ag(s) + HCOO^-(aq) +4NH_3(aq) + 2H_2O(l)$

(ii) $N_2H_4(l) + 2H_2O_2(l) \rightarrow N_2(g) + 4H_2O(l)$

Why does the same reductant, thiosulphate react differently with iodine and bromine?

5. Balance the following redox reactions by ion – electron method: [2]

(i) $H_2O_2\ (aq) + Fe^{2+}\ (aq) \rightarrow Fe^{3+}\ (aq) + H_2O\ (l)$ (in acidic solution)

(ii) $Cr_2O_7^{2-} + SO_2(g) \rightarrow Cr^{3+}\ (aq) + SO_4^{2-}\ (aq)$ (in acidic solution)

6. Justify that the reaction: [2]

$2Cu_2O(s) + Cu_2S(s) \rightarrow 6Cu(s) + SO_2\ (g)$ is a redox reaction. Identify the species oxidised/reduced, which acts as an oxidant and which acts as a reductant.

7. In the reactions given below, identify the species undergoing oxidation and reduction: [3]

(i) $H_2S\ (g) + Cl_2\ (g) \rightarrow 2\ HCl\ (g) + S\ (s)$

(ii) $3Fe_3O_4\ (s) + 8\ Al\ (s) \rightarrow 9\ Fe\ (s) + 4Al_2O_3\ (s)$

(iii) $2\ Na\ (s) + H_2\ (g) \rightarrow 2\ NaH\ (s)$

8. Balance the following equations in basic medium by ion-electron method and oxidation number methods and identify the oxidising agent and the reducing agent. [4]

(a) $P_4(s) + OH^-(aq) \rightarrow PH_3(g) + HPO_2^-\ (aq)$ (b) $N_2H_4(l) + ClO_3^-\ (aq) \rightarrow NO(g) + Cl^-(g)$

9. Consider the elements : Cs, Ne, I and F [4]

(a) Identify the element that exhibits only negative oxidation state.

(b) Identify the element that exhibits only postive oxidation state.

(c) Identify the element that exhibits both positive and negative oxidation states.

(d) Identify the element which exhibits neither the negative nor does the positive oxidation state.

10. Depict the galvanic cell in which the reaction $Zn(s) + 2Ag^+(aq) \rightarrow Zn^{2+}(aq) + 2Ag(s)$ takes place, Further show: [4]

(i) which of the electrode is negatively charged,

(ii) the carriers of the current in the cell, and

(iii) individual reaction at each electrode.