

REDOX REACTIONS

Q.1 The oxidation number of carbon in CH_2O is-

- (A) -2 (B) $+2$ (C) 0 (D) $+4$

Q.2 The oxidation number of phosphorus in $\text{Ba}(\text{H}_2\text{PO}_2)_2$ is-

- (A) $+3$ (B) $+2$ (C) $+1$ (D) -1

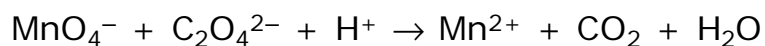
Q.3 White P reacts with caustic soda, the products are PH_3 and NaH_2PO_2 . This reaction is an example of-

- (A) Oxidation (B) Reduction
(C) Disproportionation (D) Neutralisation

Q.4 The oxidation state of the most electronegative element in the products of the reaction between BaO_2 and H_2SO_4 are-

- (A) 0 and -1 (B) -1 and -2 (C) -2 and 0 (D) -2 and $+1$

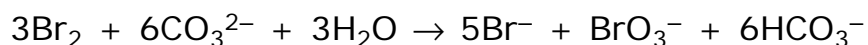
Q.5 For the redox reaction,



The correct coefficients of the reactants for the balanced reaction are-

- | | MnO_4^- | $\text{C}_2\text{O}_4^{2-}$ | H^+ |
|-----|------------------|-----------------------------|--------------|
| (A) | 2 | 5 | 16 |
| (B) | 16 | 5 | 2 |
| (C) | 5 | 16 | 2 |
| (D) | 2 | 16 | 5 |

Q.6 In the reaction,



- (A) Bromine is oxidised and carbonate is reduced
(B) Bromine is reduced and water is oxidised
(C) Bromine is neither reduced nor oxidised
(D) Bromine is both reduced and oxidised.

SOLUTIONS (REDOX REACTIONS)

Ans.1 In $\text{H}-\overset{\text{O}}{\parallel}{\text{C}}-\text{H}$ the O.N. of carbon is zero.
 $2(+1) + 1(-2) + x = 0$
 $\therefore x = 0.$

Ans.2 O.N. of P = x (O.N. of Ba = +2, H = +1, O = -2)
 $\therefore 2 \times 1 + 4 \times 1 + 2 \times x + 4 \times (-2) = 0$
 $x = +1$

Ans.3 $\text{P} + 3\text{NaOH} + 3\text{H}_2\text{O} \longrightarrow 3\text{NaH}_2\text{PO}_2 + \text{PH}_3$
 O.N. of P in NaH_2PO_2 and PH_3 are +1 and -3 respectively. Therefore in this reaction P undergoes disproportionation.

Ans.4 Reaction between BaO_2 and H_2SO_4 is
 $\text{BaO}_2 + \text{H}_2\text{SO}_4 \longrightarrow \text{BaSO}_4 + \text{H}_2\text{O}_2.$
 The most electron negative element in products is oxygen. O.N. of O in BaSO_4 and H_2O_2 is -2 and -1 respectively.

Ans.5 The balanced chemical equations
 $2\text{MnO}_4^- + 5\text{C}_2\text{O}_4^{2-} + 16\text{H}^+ \longrightarrow 2\text{Mn}^{2+} + 10\text{CO}_2 + 8\text{H}_2\text{O}$

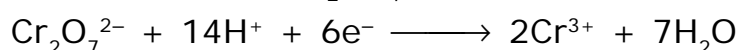
Ans.6 O.N. of Br increases from 0 in Br_2 to +5 in BrO_3^\ominus ion and O.N. of Br also decreases from 0 in Br_2 to -1 in Br^\ominus ion.

Ans.7 For elementary state it is zero
 \therefore For $\text{S}_8 = 0$ in S_2F_2 it is +1 and in H_2S it is -2.

Ans.8 In CrO_2Cl_2 , let O.N. of Cr = x
 $\therefore x + 2(-2) + 2(-1) = 0$
 [O.N. of O = -2, O.N. of Cl = -1]
 $x - 4 - 2 = 0$ or $x = 6$

Ans.9 O.N. of Cl in ClO^\ominus , ClO_3^\ominus and Cl^\ominus ions are +1, +5 and -1 respectively. Therefore O.N. of Cl increases from +1 (in ClO^\ominus ions) to +5 (in ClO_3^\ominus ion) and also decreases from +1 (in ClO^\ominus ion) to -1 (in Cl^\ominus ion). Therefore, it is a disproportionation reactions.

Ans.10 Potassium dichromate acts like an oxidising agent : In the presence of dilute H_2SO_4 as follows.



\therefore Eq. mass of potassium dichromate = $\frac{\text{mol. mass of potassium dichromate}}{6}$