

Redox Reactions

CHAPTER 8

1. Which of the following is a redox reaction?

[2002]

- (a) $\text{NaCl} + \text{KNO}_3 \rightarrow \text{NaNO}_3 + \text{KCl}$
 (b) $\text{CaC}_2\text{O}_4 + 2\text{HCl} \rightarrow \text{CaCl}_2 + \text{H}_2\text{C}_2\text{O}_4$
 (c) $\text{Mg}(\text{OH})_2 + 2\text{NH}_4\text{Cl} \rightarrow \text{MgCl}_2 + 2\text{NH}_4\text{OH}$
 (d) $\text{Zn} + 2\text{AgCN} \rightarrow 2\text{Ag} + \text{Zn}(\text{CN})_2$

2. Several blocks of magnesium are fixed to the bottom of a ship to

[2003]

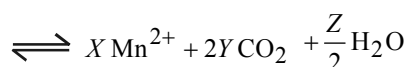
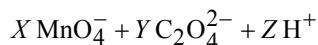
- (a) make the ship lighter
 (b) prevent action of water and salt
 (c) prevent puncturing by under-sea rocks
 (d) keep away the sharks

3. Which of the following chemical reactions depict the oxidizing behaviour of H_2SO_4 ?

[2006]

- (a) $\text{NaCl} + \text{H}_2\text{SO}_4 \longrightarrow \text{NaHSO}_4 + \text{HCl}$
 (b) $2\text{PCl}_5 + \text{H}_2\text{SO}_4 \longrightarrow$
 $2\text{POCl}_3 + 2\text{HCl} + \text{SO}_2\text{Cl}_2$
 (c) $2\text{HI} + \text{H}_2\text{SO}_4 \longrightarrow \text{I}_2 + \text{SO}_2 + 2\text{H}_2\text{O}$
 (d) $\text{Ca}(\text{OH})_2 + \text{H}_2\text{SO}_4 \longrightarrow$
 $\text{CaSO}_4 + 2\text{H}_2\text{O}$

4. In the following balanced reaction,



values of X, Y and Z respectively are

[Online May 12, 2012; 2013 Offline]

- (a) 2, 5, 16 (b) 8, 2, 5
 (c) 5, 2, 16 (d) 5, 8, 4

5. The molecular formula of a commercial resin used for exchanging ions in water softening is $\text{C}_8\text{H}_7\text{SO}_3^- \text{Na}^+$ (Mol. wt. 206). What would be the maximum uptake of Ca^{2+} ions by the resin when expressed in mole per gram resin?

[JEE M 2015]

- (a) $\frac{2}{309}$ (b) $\frac{1}{412}$
 (c) $\frac{1}{103}$ (d) $\frac{1}{206}$

6. Which of the following reactions is an example of a redox reaction?

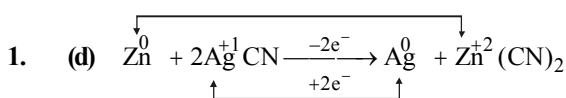
[JEE M 2017]

- (a) $\text{XeF}_4 + \text{O}_2\text{F}_2 \rightarrow \text{XeF}_6 + \text{O}_2$
 (b) $\text{XeF}_2 + \text{PF}_5 \rightarrow [\text{XeF}]^+ \text{PF}_6^-$
 (c) $\text{XeF}_6 + \text{H}_2\text{O} \rightarrow \text{XeOF}_4 + 2\text{HF}$
 (d) $\text{XeF}_6 + 2\text{H}_2\text{O} \rightarrow \text{XeO}_2\text{F}_2 + 4\text{HF}$

Answer Key

1	2	3	4	5	6									
(d)	(b)	(c)	(a)	(b)	(a)									

SOLUTIONS



The oxidation state shows a change only in (d)

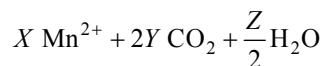
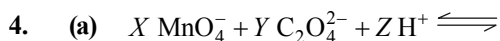
2. (b) Magnesium provides cathodic protection and prevent rusting or corrosion.

3. (c) $2\text{HI}^{-1} + \text{H}_2\text{SO}_4^{+6} \longrightarrow \text{I}_2^0 + \text{SO}_2^{+4} + 2\text{H}_2\text{O}$
 in this reaction oxidation number of S is

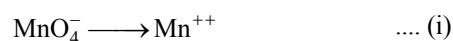
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Chemistry

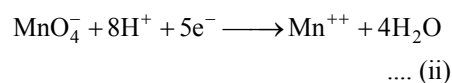
decreasing from +6 to +4 hence undergoing reduction and for HI oxidation Number of I is increasing from -1 to 0 hence undergoing oxidation therefore H_2SO_4 is acting as oxidising agent.



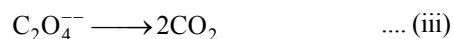
First half reaction



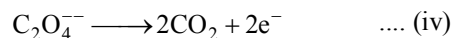
On balancing



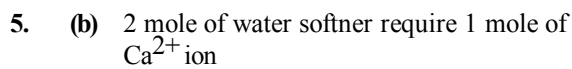
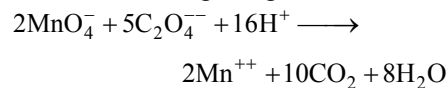
Second half reaction



On balancing



On multiplying eqn. (ii) by 5 and (iv) by 2 and then adding we get



So, 1 mole of water softner require mole of Ca^{2+} ion

Thus, will be maximum uptake

