

*Simulator***Previous Years AIEEE/JEE Mains Questions**

1. Very pure hydrogen (99.9%) can be made by which of the following processes? [AIEEE 2012]
- (1) Reaction of salt like hydrides with water
 (2) Reaction of methane with steam
 (3) Mixing natural hydrocarbons of high molecular weight
 (4) Electrolysis of water
2. In which of the following reaction H_2O_2 acts as a reducing agent ? [JEE(Main) 2014]
- (1) $\text{H}_2\text{O}_2 + 2\text{H}^+ + 2\text{e}^- \rightarrow 2\text{H}_2\text{O}$ (2) $\text{H}_2\text{O}_2 - 2\text{e}^- \rightarrow \text{O}_2 + 2\text{H}^+$
 (3) $\text{H}_2\text{O}_2 + 2\text{e}^- \rightarrow 2\text{OH}^-$ (4) $\text{H}_2\text{O}_2 + 2\text{OH}^- - 2\text{e}^- \rightarrow \text{O}_2 + 2\text{H}_2\text{O}$
 (1) (1), (3) (2) (2), (4) (3) (1), (2) (4) (3), (4)
3. Which of the following statements about Na_2O_2 is not correct ? [JEE(Main) 2014]
- (1) Na_2O_2 oxidises Cr^{3+} to CrO_4^{2-} in acid medium
 (2) It is diamagnetic in nature
 (3) It is the super oxide of sodium
 (4) It is a derivative of H_2O_2
4. Hydrogen peroxide acts both as an oxidising and as a reducing agent depending upon the nature of the reacting species. In which of the following cases H_2O_2 acts as a reducing agent in acid medium ? :- [JEE(Main)Online-2014]
- (1) MnO_4^- (2) SO_3^{2-} (3) KI (4) $\text{Cr}_2\text{O}_7^{2-}$
5. Permanent hardness in water cannot be cured by: [JEE(Main)Online-2015]
- (1) Treatment with washing soda (2) Calgon's method
 (3) Boiling (4) Ion exchange method

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
| 4 | 2 | 3 | 1 | 3 |

6. From the following statements regarding H_2O_2 , choose the incorrect statement :

[JEE(Main)Online-2015]

- (1) It has to be stored in plastic or wax lined glass bottles in dark
- (2) It has to be kept away from dust
- (3) It can act only as an oxidizing agent
- (4) It decomposes on exposure to light

7. Hydrogen peroxide oxidises $[\text{Fe}(\text{CN})_6]^{4-}$ to $[\text{Fe}(\text{CN})_6]^{3-}$ in acidic medium but reduces $[\text{Fe}(\text{CN})_6]^{3-}$ to $[\text{Fe}(\text{CN})_6]^{4-}$ in alkaline medium. The other products formed are, respectively :

[JEE(Main)Online-2018]

- (1) $(\text{H}_2\text{O} + \text{O}_2)$ and $(\text{H}_2\text{O} + \text{OH}^-)$
- (2) H_2O and $(\text{H}_2\text{O} + \text{O}_2)$
- (3) H_2O and $(\text{H}_2\text{O} + \text{OH}^-)$
- (4) $(\text{H}_2\text{O} + \text{O}_2)$ and H_2O

| | |
|---|---|
| 6 | 7 |
| 3 | 2 |

Solutions

1. Very pure hydrogen (99.9%) can be made by electrolysis of water.

2. When H_2O_2 act as reducing agent then it evolve.

3. Na_2O_2 is peroxide of sodium

4. $\text{H}_2\text{O}_2 + \text{MnO}_4^- \rightarrow \text{Mn}^{+2} + \text{O}_2$

(R.A)

$\text{H}_2\text{O}_2 + \text{SO}_3^{2-} \rightarrow \text{SO}_4^{2-}$

(O.A) (R.A)

$\text{I}^0 + \text{H}_2\text{O}_2 \rightarrow \text{I}_2 + \text{H}_2\text{O}$

(O.A)

$\text{Cr}_2\text{O}_7^{2-} + \text{H}_2\text{O}_2 \xrightarrow{\text{non redox rxn}} \text{CrO}_5$

5. Permanent hardness in water cannot cured by boiling of water

6. H_2O_2 can act as oxidizing as well as reducing agent depend on condition.

7. (i) $[\text{Fe}^{+2}(\text{CN})_6]^{4-} + \text{H}_2\text{O}_2^{-1} + 2\text{H}^+$

↓

$[\text{Fe}^{+3}(\text{CN})_6]^{3-} + 2\text{H}_2\text{O}^{-2}$

(ii) $[\text{Fe}^{+3}(\text{CN})_6]^{3-} + \text{H}_2\text{O}_2^{-1} + 2\text{OH}^-$

↓

$[\text{Fe}^{+2}(\text{CN})_6]^{4-} + \text{O}_2^0 + 2\text{H}_2\text{O}$