

## Hydrogen and Its compounds


 Self Evaluation Test -17

- Temperature of maximum density in  $H_2O$  and  $D_2O$  respectively are
  - 277.15 K, 284.75 K
  - 273.15 K, 277.15 K
  - 277.15 K, 285.75 K
  - 284.75 K, 277.15 K
- Non-metallic oxides dissolves in water to form
  - Acidic solution
  - Alkaline solution
  - Neutral solution
  - None of these
- Ordinary water is not used as a moderator in nuclear reactors because
  - It cannot slow down fast moving neutrons
  - It cannot remove the heat from the reactor core
  - It absorbs the fast moving neutrons
  - Of its corrosive action on the metallic parts of the nuclear reactor
- Brackish water mostly contains
  - Calcium chloride
  - Barium sulphate
  - Sodium chloride
  - Mineral acids
- $TiH_{1.73}$  is an example of
  - Ionic hydride
  - Covalent hydride
  - Metallic hydride
  - Polymeric hydride
- The volume strength of perhydrol is
  - 20
  - 30
  - 100
  - 10
- The solubility of an ionic compound is compared in heavy and simple water. It is
  - Higher in heavy water
  - Lower in heavy water
  - Same in heavy water and simple water
  - Lower in simple water
- Which of the following cannot be reduced by  $H_2O_2$ 
  - $Ag_2O$
  - $Fe^{3+}$
  - Acidified  $KMnO_4$
  - Acidified  $K_2Cr_2O_7$
- Hydrogen can be prepared by the action of dil.  $H_2SO_4$  on
  - Copper
  - Iron
  - Lead
  - Mercury
- The element whose hydride contains maximum number of hydrogen per atom of the element is
  - Na
  - O
  - B
  - Si
- Indicator type silica gel used as a dehumidifier contains
  - $Cu^{2+}$  ions
  - $Ni^{2+}$  ions
  - $Co^{2+}$  ions
  - $Fe^{2+}$  ions
- To an aqueous solution of  $AgNO_3$  some  $NaOH(aq)$  is added, till a brown ppt. is obtained. To this  $H_2O_2$  is added dropwise. The ppt. turns black with the evolution of  $O_2$ . The black ppt. is
  - $Ag_2O$
  - $Ag_2O_2$
  - $AgOH$
  - None of these
- Atomic hydrogen reacts with oxygen to give
  - Almost pure water
  - Almost pure hydrogen peroxide
  - A mixture of water and hydrogen peroxide
  - None of these
- Which of the following cannot be used for the preparation of  $H_2$ 
  - $Zn + HCl(dil.) \rightarrow$
  - $NaH + H_2O \rightarrow$
  - $Zn + HNO_3(dil.) \rightarrow$



## 702 Hydrogen and Its compounds



15. The process used for the removal hardness of water is

(a) Calgon

(b) Baeyer

(c) Serpeck

(d) Hoope

[EAMCET 2001]

# AS Answers and Solutions

(SET -17)

1. (a) Temperature of maximum density of  $H_2O$  is 277.15 K.

Temperature of maximum density of  $D_2O$  is 284.75 K.

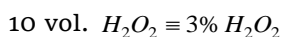
2. (a) Non metallic oxides in water are form acidic solutions e.g.  $P_2O_5 + 3H_2O \rightarrow 2H_3PO_4$   
phosphoric acid

3. (c) Ordinary water absorbs fast moving neutrons, thus stopping the process of nuclear fission.

4. (c) Brackish water mostly contains sodium chloride.

5. (c) It is a metallic hydride.

6. (c) The volume strength of perhydral is 100 perhydral is 30%  $H_2O_2$



$\therefore 30\% \text{ of } H_2O_2 \equiv 100 \text{ vol. } H_2O_2$

7. (b) The solubility of an ionic compound is more in simple water and less in heavy water.

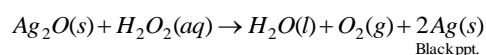
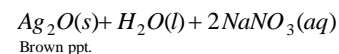
8. (b)  $H_2O_2$  cannot reduce  $Fe^{3+}$ . All other compounds are reduced by  $H_2O_2$ .

9. (b) Hydrogen cannot be prepared by the action of dil.  $H_2SO_4$  on copper or mercury as these two metals cannot displace hydrogen from acids. Action of dil.  $H_2SO_4$  are stops after sometimes due to the formation of insoluble  $PbSO_4$ . Only, iron reacts rapidly with dil.  $H_2SO_4$  to give  $H_2$ .

10. (d) Hydride of  $Si(SiH_4)$  contains more hydrogen atoms than hydrides of  $Na(NaH)$ ,  $O(H_2O)$ ,  $B(BH_3)$ .

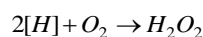
11. (c) Indicator type of gel used as a dehumidifier contains  $CO^{2+}$  ions, when dry it is blue in colour and on absorbing moisture it becomes pink.

12. (d)  $2AgNO_3(aq) + 2NaOH(aq) \rightarrow$

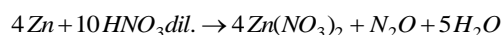
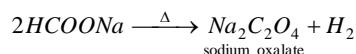
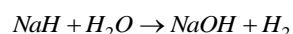


The finely divided Ag is black in colour.

13. (b) Atomic hydrogen reacts with oxygen to give almost pure hydrogen peroxide.



14. (c)  $Zn + 2HCl(dil.) \rightarrow ZnCl_2 + H_2$



- \*\*\*5. (a) Calgon process is used for the removal of hardness of water.

