

Class 11 Hydrogen MCQs

1. Hardness of water is due to the pair of ions
(a) Ca^{2+} and K^+ (b) Mg^{2+} and K^+
(c) Ca^{2+} and Mg^{2+} (d) Ba^{2+} and Zn^{2+}

Ans: (c)

Solution: Ca^{2+} and Mg^{2+} ions cause the hardness of water.

2. Nascent hydrogen consists of:
(a) Hydrogen atoms with excess energy
(b) Hydrogen molecules with excess energy
(c) Hydrogen ions within the excited state
(d) Solvated protons

Ans: (a)

Solution: Nascent hydrogen [H] consists of hydrogen atoms with excess energy.

3. Moist H_2O_2 cannot be dried over conc. H_2SO_4 because:
(a) it can catch fire (b) it is reduced by H_2SO_4
(c) it is oxidised by H_2SO_4 (d) none of these is true

Ans: (c)

Solution: Moist H_2O_2 cannot be dried over conc. H_2SO_4 because it is oxidised by H_2SO_4

4. The adsorption of hydrogen by palladium is called -----
(a) Hydrogenation (b) Hydration
(c) Reduction (d) Occlusion

Ans: (a)

Solution: Adsorption of a gas on the metal surface is called occlusion

5. Which is used as a moderator in a nuclear reactor?
(a) H_2O (b) Alum (c) D_2O (d) Any of these

Ans: (c)

Solution: D_2O (Heavy water) is used as a moderator in nuclear reactors.

6. Zeolite used to soften hardness of water is hydrated:
- (a) Potassium aluminium borate
 - (b) Sodium aluminium silicate
 - (c) Calcium aluminium silicate
 - (d) Zinc aluminum borate

Ans: (b)

Solution: Zeolite used to soften hardness of water is hydrated sodium aluminium silicate

7. Permanent hardness from water can be removed by adding -----
- (a) Na_2CO_3
 - (b) K
 - (c) $\text{Ca}(\text{OCl})\text{Cl}$
 - (d) Cl_2

Ans: (a)

Solution: Na_2CO_3 removes permanent hardness from water

8. The reagent(s) used for softening the temporary hardness of water is(are) -----
- (a) $\text{Ca}_3(\text{PO}_4)_2$
 - (b) $\text{Ca}(\text{OH})_2$
 - (c) Na_2CO_3
 - (d) Cl_2

Ans: (b, c)

Solution: Both $\text{Ca}(\text{OH})_2$ and Na_2CO_3 can remove temporary hardness from water.

9. Which of the following statements about hydrogen is incorrect?
- (a) Hydronium ion, H_3O^+ exists freely in solution.
 - (b) Dihydrogen does not act as a reducing agent.
 - (c) Hydrogen has three isotopes of which tritium is the most common.
 - (d) Hydrogen never acts as cation in ionic salts.

Ans: (b, c)

Solution: Dihydrogen can act as a powerful reducing agent.

Example $\text{CuO} + \text{H}_2 \rightarrow \text{Cu} + \text{H}_2\text{O}$.

Out of three isotopes, protium (${}_1\text{H}^1$) is the most common.

10. Water softening by Clarke's process uses:
- (a) Calcium bicarbonate
 - (b) Sodium bicarbonate
 - (c) potash alum
 - (d) Calcium hydroxide

Ans: (d)

Solution: Water softening by Clarke's process uses calcium hydroxide