HYDROGEN

ONE MARK QUESTIONS

1 Name a hydride that can act as a) Lewis acid b) Lewis base.

2 Write a balanced chemical equation for the formation of ammonia. Also mention the reaction conditions

3 How will you show that H_2O_2 is a powerful oxidizing agent?

4 What do you understand by auto protolysis of water?

5 What is understood by hydrogen economy?

6 Explain giving reasons (Each carries 1 mark)

a. The dihedral angle in H_2O_2 decreases in the solid state.
b. Ionic hydrides are frequently used to remove traces of water from organic compounds.
c. Heavy water is used in nuclear reactors
d. Liquid hydrogen is used as a rocket fuel.
e. Hard water does not lather easily with soap.
f. Zeolite purified water is not de-ionised.
g. H_2O_2 is stored in wax-lined brown coloured bottles.
h. Urea is added to H_2O_2 during storage.
i. H_2O_2 is used to restore oil paintings.
j. Water is densest at 4 degree Celsius
k. Hydrogen is inert at room temperature

TWO MARKS QUESTIONS

1 Compare the structures of H_2O and H_2O_2.

2 Describe the industrial applications of hydrogen dependent on:

a. The heat liberated when its atoms combine on the surface of the metal.
b. Effect on unsaturated organic systems in presence of a catalyst

3 Complete & balance the following equations

a. $CuO(s) + H_2(g) \rightarrow$
b. $CO(g) + H_2(g) \rightarrow$

4 Differentiate between hydrolysis and hydration using suitable examples

5 Explain the following reactions with equations

a) Coal gasification b) Water gas shift reaction

6 Describe the permutit process for softening of hard water

THREE MARKS QUESTIONS

1 Complete and balance the following equations.

a. Mg_3N_2 + H_2O (l) →

b. PbS(s) + H_2O_2 (l) →

c. MnO_4^- (aq) + H_2O_2 (l) (acid) →

2 A binary compound of hydrogen is non-conducting in the solid state. On electrolysis of the molten compound, hydrogen was liberated at the anode. What class of compound is this? Give an example. Give equation for its reaction with water.

3 Discuss the different types of hydrides with examples

4 Compare the principle and method of softening of hard water by

a) ion exchange method b)synthetic resin method

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