

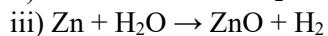
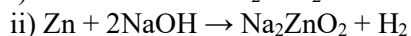
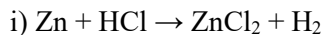
Exercise :6 B

1. Hydrogen can be prepared with the metal Zinc by using

(i) acid (ii) alkali (iii) water

Give an equation in each case.

Solution:



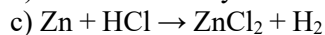
2. For laboratory preparation of Hydrogen, give the following (a) materials used

(b) method of collection (c) chemical equation (d) fully labelled diagram.

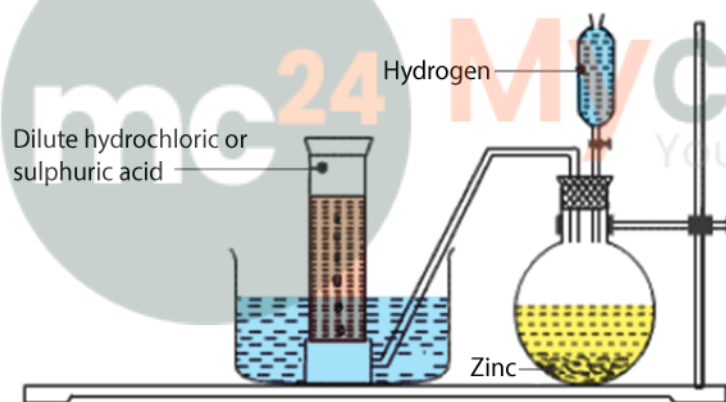
Solution:

a) Granulated zinc, dilute HCl or dil. H_2SO_4

b) It is collected by the downward displacement of water.



d)



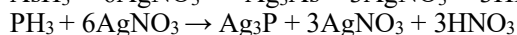
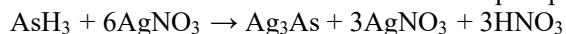
3. a) Name the impurities present in hydrogen prepared in the laboratory. (b) How can these impurities be removed.

Solution:

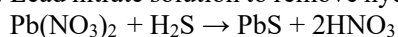
a) Hydrogen sulphide, sulphur dioxide, oxides of nitrogen, phosphine, arsine, carbon dioxide and water vapour are the impurities present in the hydrogen prepared in the laboratory.

b) The impurities can be removed from hydrogen by passing it through

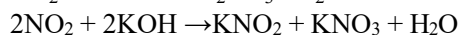
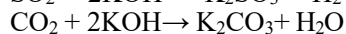
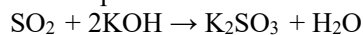
1. Silver nitrate solution to remove arsine and phosphine.



2. Lead nitrate solution to remove hydrogen sulphide.



3. Caustic potash solution to remove sulphur dioxide, carbon dioxide and oxides of nitrogen.



4. A drying agent used to dry the gas. Common drying agents such as fused calcium chloride, caustic potash stick and phosphorus pentoxide remove water vapour.

So, the gas is purified and dried and then collected over mercury because mercury does not react with it.

4. Which test should be made before collecting hydrogen in a gas jar ?

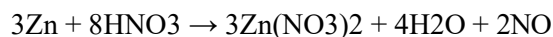
Solution:

Hydrogen burns with a pop sound, hence Hydrogen should be tested with a burning flame, if the burning produces a pop sound it confirms the production of Hydrogen gas.

5. Why is nitric acid not used in the preparation of hydrogen?

Solution:

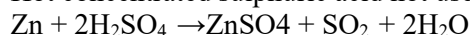
Nitric acid not used in the preparation of hydrogen because Nitric acid is a powerful oxidising agent, and the oxygen formed due to its decomposition oxidises hydrogen to give water thus defeating the purpose of the reaction.



6. Why is hot concentrated sulphuric acid not used in the preparation of hydrogen

Solution:

Hot concentrated sulphuric acid not used in the preparation of hydrogen because it will produce sulphur dioxide.



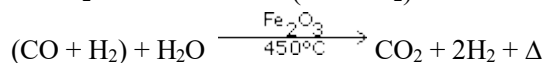
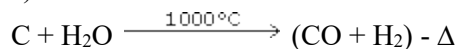
7. Hydrogen is manufactured by 'Bosch Process' .

(a) Give the equations with conditions.

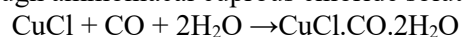
(b) How can you obtain Hydrogen from a mixture of Hydrogen and carbon monoxide.

Solution:

a)



b) We can obtain Hydrogen from a mixture of Hydrogen and carbon monoxide by passing the mixture through ammoniacal cuprous chloride solution in order to dissolve any uncombined carbon monoxide.

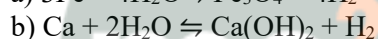
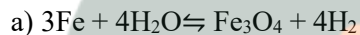


8. Give equations to express the reaction between

(a) steam and red hot iron

(b) calcium and water

Solution:



9. A small piece of calcium metal is put into a small trough containing water. There is effervescence and white turbidity is formed.

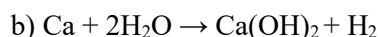
(a) Name the gas formed in the reaction. How would you test the gas ?

(b) Write an equation for the reaction.

(c) What do you observe when a few drops of red litmus solution are added to the turbid solution ?

Solution:

a) Hydrogen gas, It can be tested by litmus paper as it turn blue from red.



c) The solution turns blue.

10. Thin strips of magnesium, copper and iron are taken. (a) Write down what happens when these metals are treated as follows

- (i) Heated in presence of air
- (ii) Heated with dil. HCl Added to an aqueous solution of zinc sulphate
- (iii) Added to an aqueous solution of Zinc sulphate

(b) Arrange these metals in descending order of reactivity.

Solution:

- a) i) When we heat magnesium, copper and iron in presence of air they form respective oxides.
 - ii) Magnesium and iron react with HCl liberating hydrogen and forming their respective salts.
 - iii) Magnesium will displace zinc from zinc sulphate solution as magnesium is more reactive than zinc in the activity series of metals.
- b) $Mg > Fe > Cu$

11. Choose the correct option

a) Hydrogen is evolved by the action of cold Dil. HNO_3 on

- A. Fe B. Cu C. Mg D. Zn

b) Which metal absorbs Hydrogen?

- A. Al B. Fe C. Pd D. K

c) The composition of the nucleus of deuterium is

- A. $1e^-$ and 1P B. 1P and 1A c) in and $1e^-$ D. 2P and $1e^-$

d) Elements which show unique nature in the preparation of Hydrogen are

- A. Na, K, Li B. Mg, Ca, Ba C. Al, Zn, Pb D. Fe, Cu, Ag

Solution:

- a) C. Mg
- b) C. Pd
- c) C. 1 n and $1e^-$
- d) C. Al, Zn, Pb

12. Give reason for the following

- a) Zinc granules are used in laboratory preparation of Hydrogen.
- b) Purified and dry Hydrogen is collected over Mercury.
- c) The end of the thistle funnel should be dipped under acid.
- d) Dilute Sulphuric acid cannot be replaced by concentrated acid in the preparation of Hydrogen.

Solution:

- a) Zinc granules are used in laboratory preparation of Hydrogen because the impurity present in granulated zinc is copper, whose catalysing effect speeds up the rate of the reaction.
- b) Purified and dry Hydrogen is collected over Mercury will not have any impact
- c) The end of the thistle funnel should be dipped under acid to prevent escape of gas from the thistle funnel.
- d) Dilute Sulphuric acid cannot be replaced by concentrated acid in the preparation of Hydrogen. Because it is a strong oxidising agent and it will produce sulphur dioxide.



Myclass24
Your Class. Your Pace.