

CLASS - VIII SUBJECT - CHEMISTRY

CHAPTER - 6 TEACHER - ANAMIKA

Preparation of hydrogen:-

Hydrogen from cold water

Reactive metals can displace hydrogen from water. Very reactive metals like potassium, sodium and calcium can even react with cold water to form hydrogen and their corresponding hydroxides.

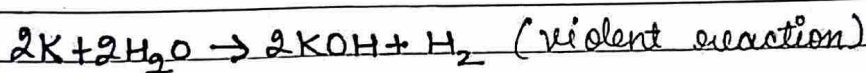
1. From potassium -

- Potassium is light weight metal, it floats on water surface then melts forming



→ Blue-coloured flame

→ Potassium a silvery grey globule cold water which reacts on the surface.

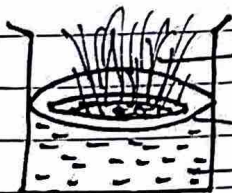


This reaction is highly exothermic due to which potassium melts and catches fire producing lilac flame.

- Bubbles of hydrogen are seen and soapy alkaline colourless solution of potassium hydroxide is formed.

From sodium

- Sodium floats on water then melts and forms a silvery grey globule which reacts on the surface.



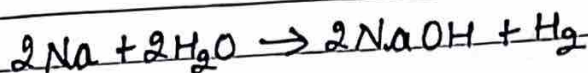
→ Golden yellow flame

→ Sodium

→ Cold water

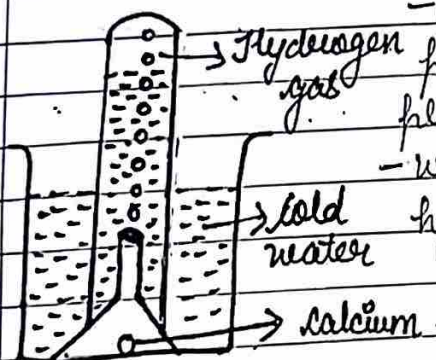
- Reaction is less exothermic and less vigorous compared to potassium.

(P.T.O)

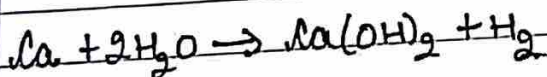


- Sodium catches fire due to the reaction heat and burns with a golden yellow flame.
- Hydrogen bubbles are seen and soapy alkaline colourless solution of sodium hydroxide is formed.

From calcium

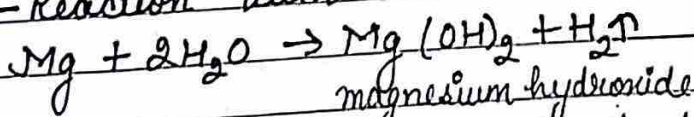


- Calcium sinks to the bottom.
- Reaction is slow thus the hydrogen produced can be collected by placing a funnel over calcium.
- white turbid solution of calcium hydroxide is formed.



From Magnesium

- Reaction with hot water



It reacts with boiling water slowly.

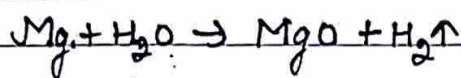
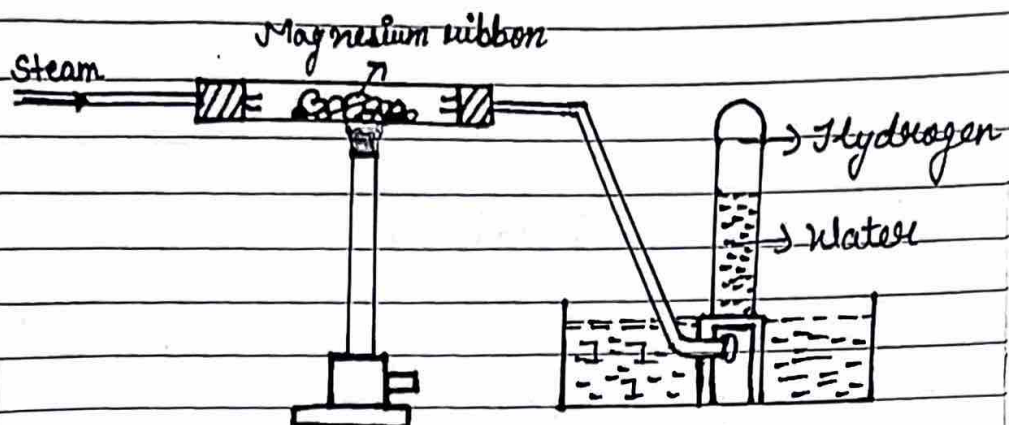
- Reaction with steam

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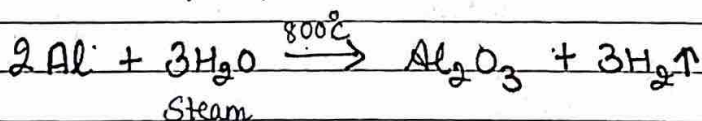


Magnesium burns in steam with a bright white light producing a white ash which is magnesium oxide and hydrogen gas.

Hydrogen from steam

From Aluminium

Aluminium reacts with steam to form aluminium oxide and hydrogen.



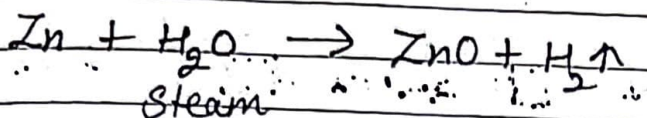
Al_2O_3 forms a coating over aluminium and stops further reaction.

The oxide coating breaks at high temperature and the reaction can take place.

From Zinc

Being less reactive only heated zinc can react with steam, to give zinc oxide and hydrogen.

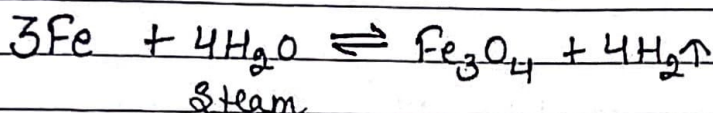
(P.T.O)



ZnO is yellow when hot but white when cold.

From Iron

Iron is less reactive than zinc, so only red hot iron can react with steam. It forms ferric tetra-oxide and hydrogen gas.



It is a reversible reaction, if the hydrogen formed is not removed it changes the iron oxide back to iron by reacting with it.

Here the forward reaction is faster in the beginning because reactants are more in amount. As the reaction proceeds the amount of product increases and the backward reaction now becomes faster and the forward reaction becomes slower. At 700°C an equilibrium stage is attained, when the rate of forward and backward reaction become same.

At equilibrium the amount of reactant and product -ts remain same.

Action of steam on carbon -

When steam is passed over red hot coke (carbon), water gas is formed.

(P.T.O.)