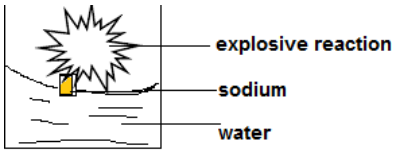
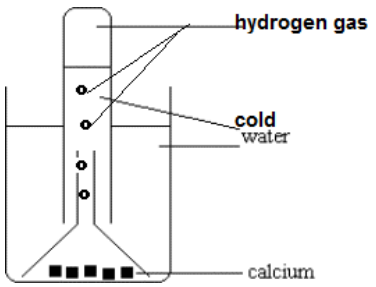
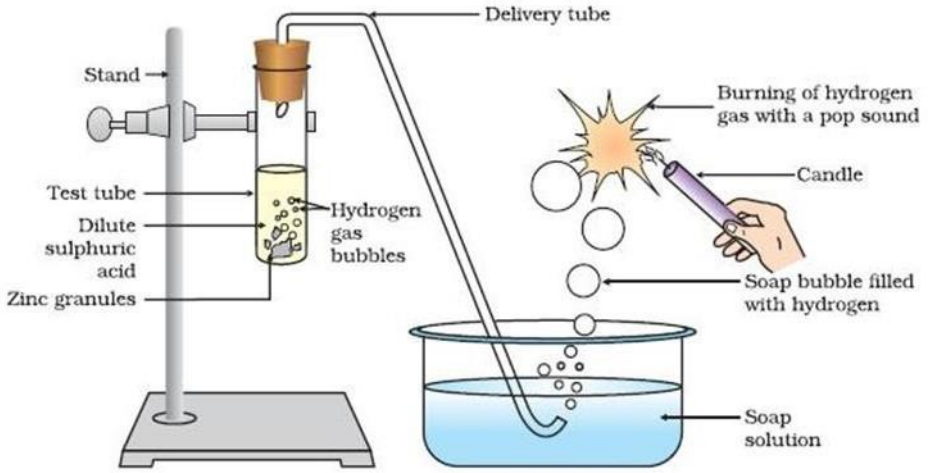
ICSE CLASS 8 CHEMISTRY LESSON 2
HYDROGEN

	Hydrogen from water	Hydrogen from dil. HCl	Hydrogen from alkalis
Sodium and potassium	Violent explosive reaction with cold water  $2Na + 2H_2O \rightarrow 2NaOH + H_2$	Violent explosive reaction to give NaCl and Hydrogen $2Na + 2HCl \rightarrow 2NaCl + H_2$	No action
Calcium	Reacts with cold water to form $Ca(OH)_2$ and H_2  $Ca + 2H_2O \rightarrow Ca(OH)_2 + H_2$	Gives calcium chloride and hydrogen $Ca + 2HCl \rightarrow CaCl_2 + H_2$	No action
Magnesium	Reacts with boiling water to release hydrogen $Mg + H_2O \rightarrow MgO + H_2$	Gives magnesium chloride and hydrogen $Mg + HCl \rightarrow MgCl_2 + H_2$	No action
Zinc	Reacts with steam to release hydrogen $Zn + H_2O \rightarrow ZnO + H_2$	Gives zinc chloride and hydrogen $Zn + 2HCl \rightarrow ZnCl_2 + H_2$	Sodium zincate Because it is amphoteric $Zn + 2NaOH \rightarrow Na_2ZnO_2 + H_2$
Iron	Red hot iron reacts with steam to release hydrogen $3Fe + 4H_2O \leftrightarrow Fe_3O_4 + 4H_2$	Forms ferrous chloride and hydrogen $Fe + 2HCl \rightarrow FeCl_2 + H_2$	No action

Lab preparation of Hydrogen



Properties of Hydrogen

- Pure hydrogen burns but it is a non-supporter of combustion

- Burns in oxygen with a blue flame to form steam
  $2H_2 + O_2 \rightarrow 2H_2O$ + Heat
- $H_2 + Cl_2 \rightarrow 2HCl$ (hydrogen chloride gas)
- $3H_2 + N_2 \leftrightarrow 2NH_3$ + Heat (ammonia manufacture)
- $H_2 + S \rightarrow H_2S$ (hydrogen sulphide gas with rotten eggs smell)
- $CuO + H_2 \rightarrow Cu + H_2O$ (reducing action)

Uses of hydrogen

- Cutting and welding metals
- As fuel
- Hydrogenation of vegetable oil
- Manufacture of ammonia, methanol, HCl
- Hydrogen balloons