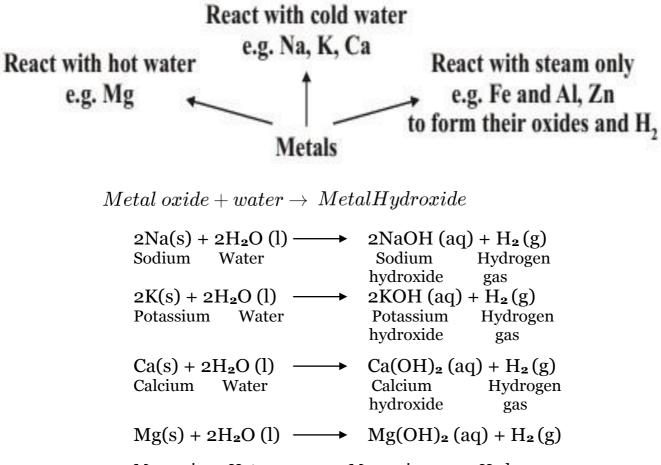
# CHEMISTRY STUDY MATERIALS FOR CLASS 10 GANESH KUMAR DATE:- 25/05/2020

### **Chapter- 3 (Metals and Non-metals- Revision Notes)**

REACTION WITH WATER: Metal oxides on reaction with water form alkalis.



Magnesium Hot<br/>waterMagnesium<br/>hydroxideHydrogen<br/>gas

## In case of Ca and Mg, the metal starts floating due to bubbles of hydrogen gas sticking to its surface.

 $4Al(s) + 6H_2O(l) \longrightarrow 2Al_2O_3(aq) + 3H_2(g)$ Aluminium Steam Aluminium Hydrogen oxide gas  $3Fe(s) + 4H_2O(l) \longrightarrow Fe_3O_4(aq) + 4H_2(g)$ Fereso-ferric Iron Steam Hydrogen oxide gas  $\rightarrow$  ZnO (aq) + 2H<sub>2</sub>(g) Zn(s) + $2H_2O(l)$  -Zinc Zinc Hydrogen Steam oxide gas

Inert metals like Au and Ag do not react with water.

#### **REACTION WITH ACIDS**

Metal +dilute acid → Salt + Hydrogen gas

Metals react with dilute hydrochloric acid and dilute sulphuric acid to form chlorides and sulphates

$\begin{array}{c} Zn(s) + 2HCl (aq) \longrightarrow \\ Zinc & Hydrochloric \end{array}$	$ZnCl_2(aq) + H_2(g)$ Zinc Hydrogen
acid	chloride gas
Fe(s) + 2HCl (aq)	FeCl <sub>2</sub> (aq) + H <sub>2</sub> (g) Ferrous Hydrogen
acid	chloride gas
$Zn(s) + 2HCl (aq) \longrightarrow$ Zinc Hydrochloric	$ZnCl_2(aq) + H_2(g)$ Zinc Hydrogen
acid	chloride gas
Mg(s) + 2HCl (aq) —— Magnesium Hydrochloric	→ $MgCl_2(aq) + H_2(g)$ Magnesium Hydrogen
acid	chloride gas
2Al(s) + 3H <sub>2</sub> SO <sub>4</sub> (aq) — Aluminium Sulphuric	$\rightarrow Al_2(SO_4)_3(aq) + 3H_2(g)$ Aluminium Hydrogen
acid	sulphate gas
$2K(s) + H_2SO_4(aq)$ — Potassium Sulphuric acid	$\begin{array}{c} \rightarrow  K_2SO_4(aq) +  H_2(g) \\ Potassium \qquad Hydrogen \\ sulphate \qquad gas \end{array}$

#### Note: Copper, mercury and silver don't react with dilute acids.

Hydrogen gas produced is oxidised to water. This happens because  $HNO_3$  is a strong oxidising agent when metals react with nitric acid  $(HNO_3)$ . But Mg and Mn, react with very dilute nitric acid(1%- 2%) to evolve hydrogen gas. Due to formation a inert nitrate layer of Mn and Mg, nitric acid does not further react with Mn and Mg.

$\begin{array}{r} Mn(s) + HNO_3 (aq) \longrightarrow \\ Manganese & Nitric \\ acid(1\% - 2\%) \end{array}$	Mn(NO <sub>3</sub> ) <sub>2</sub> Manganese nitrate	+	H₂(g) Hydrogen gas
$\begin{array}{c} Mn(s) + HNO_3(aq) \\ Magnesium \\ acid(1\% - 2\%) \end{array}$	Mn(NO <sub>3</sub> ) <sub>2</sub> Magnesium nitrate	+	H₂(g) Hydrogen gas

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