

13
B
Al
Ba
In
Tl
—

8. p-Block: Group-13 Elements

1SAQ= 4M

CONCEPTS & DEFINITIONS

1. Elements of group 13 (group III A) are Boron (B), Aluminium(Al), Gallium(Ga), Indium (In) and Thallium (Tl) .
- 2.1 The general outer electronic configuration of IIIA group elements is $ns^2 np^1$.
- 2.2 The valency of IIIA group elements is 3 and their common oxidation states are $-3, +1$ & $+3$.
- 3.1 Boron is a **non-metal** and the other elements are metals.
- 3.2 **Highest covalency** of Boron is 4
- 3.3 The **oxide of Boron** is **acidic**
- 3.4 **Halides** of Boron are **electron deficient molecules**.
- 3.5 Boron combines with dihydrogen and forms **B₂H₆** called **Diborane** (A colourless gas)
- 3.6 Diborane is an electron deficient molecule.
- 3.7 Diborane consists of three centered two electron bonds .
- 3.8 Diborane when heated in excess of ammonia forms **Borazole (Borazine)**.
- 3.9 **Borazole** is known as **inorganic benzene** (B₃N₃H₆).
- 3.10 Two important compounds of Boron and dioxygen are **Boric acid** and **Borax**
- 3.11 **Boric acid** (H₃BO₃) is used as an **Antiseptic**.
- 3.12 **Borax** (Na₂ B₄O₇ . 10 H₂O) **is used** (i) as a flux in sholding & welding
(ii) in making optical glasses & pyrex glass (iii) as a preservative
- 4.1 Aluminium is the **most abundant** metal in Earth's crust.
- 4.2 Highest covalency of Aluminium is 6.
- 4.3 Aluminium exhibits **+3 oxidation state**.
- 4.4 The oxide of Aluminium is amphoteric.
- 4.5 Halides of Aluminium are electron deficient molecules.
- 4.6 Two important minerals of 'Al' are (i) **Bauxite** Al₂O₃ . 2H₂O (ii) **Cryolite** Na₃AlF₆ or [3NaF. AlF₃]
- 4.7 Bauxite containing **Fe₂O₃** as impurity is known as **Red Bauxite**.
It is purified by **Bayer's process** and Hall's process.

4.8 Bauxite containing SiO_2 as impurity is known as **White Bauxite**.

It is purified by **Serpeck's process**.

4.9 Mixture of Aluminium powder and Barium peroxide is known as **Ignition mixture**.

4.10 A mixture of 'Al' powder and ammonium nitrate is called 'Ammonial' and is used as **Explosive**.

4.11 A **1:3 mixture** of 'Al' powder and ferric oxide is called '**Thermite mixture**'.

4.12 Alum is a general name given to a class of double salts represented by the general formula



where $\text{X} = \text{Na}^+, \text{K}^+, \text{Rb}^+, \text{Cs}^+, \text{NH}_4^+$ and $\text{Y} = \text{Fe}^{+3}, \text{Al}^{+3}, \text{Cr}^{+3}, \text{Mn}^{+3}$.

Potash alum (common alum): $\text{K}_2\text{SO}_4 \cdot \text{Al}_2(\text{SO}_4)_3 \cdot 24\text{H}_2\text{O}$

Ferric alum : $(\text{NH}_4)_2\text{Fe}(\text{SO}_4)_2 \cdot 12\text{H}_2\text{O}$.

CONCEPT MAP OF THE p-BLOCK ELEMENTS(G-13)

