

Chemistry- X- Unit -4. Class - 24

**Production of metals**

**Different types of Alloy steels**

Alloy steels are prepared by adding other metals to steel .Different types of alloy steels are given in the table.

Alloy steels	Constituent elements	Properties	Uses
Stainless steel	Fe, Cr, Ni, C	Hard	For the manufacture of utensils, parts of vehicles
Alnico	Fe, Al, Ni, Co	Magnetic nature	For the manufacture of permanent magnets
Nichrome	Fe, Ni, Cr, C	High resistance	For making heating coils

**Aluminium**

**Different Uses of Aluminium**

**This metal is used for the transmission of electricity, for making cooking utensils, parts of vehicles, reflectors and also for many other uses.**

**Characteristics of the Aluminum**

High thermal conductivity, High electrical conductivity, Metallic lustre, etc....

**Production of Aluminium**

The process of extraction of Aluminium is called Hall-Heroult process. **Bauxite is the main ore of Aluminium. Aluminium is industrially produced through two important stages.** They are concentration of bauxite and the electrolysis of concentrated alumina.

### **Concentration of bauxite**

**Bauxite is concentrated through the leaching process.** Impure bauxite is added to hot concentrated NaOH solution, where it gets converted into sodium aluminate.

**Impurities are then filtered off.** A small quantity of freshly prepared aluminium hydroxide precipitate is added and diluted with water, to get more amount of  $\text{Al}(\text{OH})_3$  precipitate.

**The precipitate is separated, washed and then heated strongly to get alumina.**

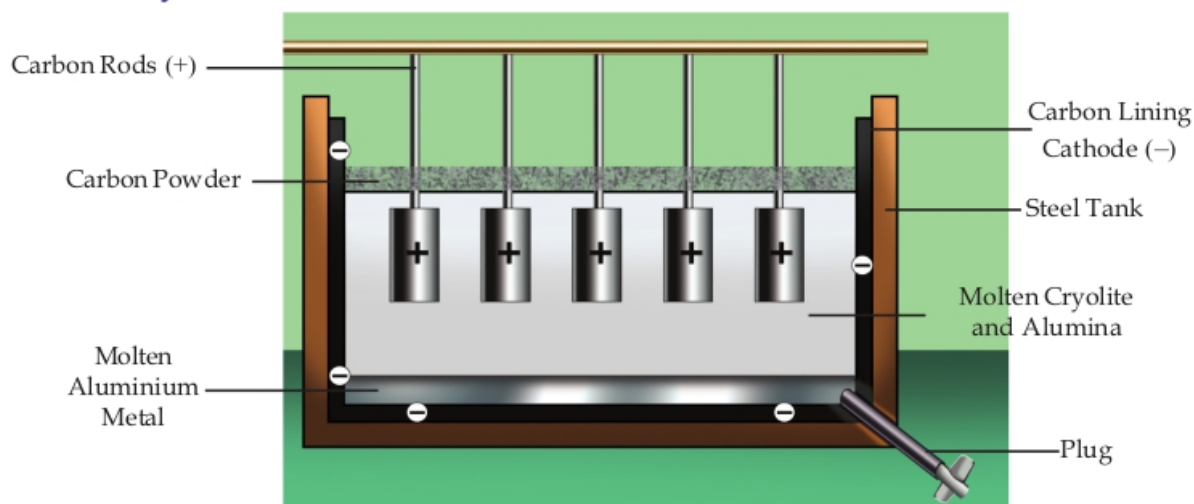
Chemical equation



**Aluminium is manufactured by the reduction of alumina using electricity as reducing agent.**

### **Electrolysis of Alumina**

The alumina ( $\text{Al}_2\text{O}_3$ ) obtained by concentration of bauxite is mixed with molten cryolite and subjected to electrolysis.



### Chemical equation



### Anode



### Cathode



### Questions

1. During the electrolysis of Alumina ,Cryolite is added to Alumina . Explain the reason ?
2. Which alloy steel is used for making permanent magnets?
3. Explain the process of producing alumina from bauxite.
4. During Hall - Heroult process ,carbon anodes are replaced from time to time. Why?

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