

Aluminium Ores

Bauxite - $\text{AlO}_x(\text{OH})_{3-2x}$

Kaolinite - $[\text{Al}_2(\text{OH})_4\text{Si}_2\text{O}_5]$

Iron Ores

Haematite - Fe_2O_3

Magnetite - Fe_3O_4

Iron pyrites - FeS_2

Siderite - FeCO_3

Copper Ores

Malachite - $\text{CuCO}_3 \cdot \text{Cu}(\text{OH})_2$

Cuprite - Cu_2O

Copper pyrites - CuFeS_2

Copper glance - Cu_2S

Zinc Ores

Zinc blende or Sphalerite - ZnS

Calamine - $ZnCO_3$

Zincite - ZnO

Concentration of Ores

Dressing or benefaction

Removal of the unwanted materials or gangue

Hydraulic Washing

Based on differences in specific gravities of the ore and the gangue particles

Froth Floatation Method

Used for removing gangue from sulphide ores

Pig Iron

Obtained from Blast furnace

It contains about 4% carbon and many impurities, e.g. S, P, Si, Mn in smaller amount

Cast Iron

It is made by melting pig iron with scrap iron and coke using a hot air blast

It contains about 3% carbon

It is extremely hard and brittle

Wrought Iron

It is malleable and is the purest form of iron used commercially

It is prepared from cast iron by oxidising impurities in a reverberatory furnace that is lined with haematite

Mond Process

It is used for refining Nickel

It is a vapour phase refining

First Ni is heated with carbon monoxide to produce nickel tetracarbonyl (volatile complex) and then it is decomposed at a higher temperature to obtain pure metal

Van Arkel Method

It is used for refining Zirconium or Titanium

It is a vapour phase refining

Useful in removing oxygen and nitrogen impurities