

Extraction of iron from there ores

Ore dressing

Improve physical & mechanical

1) Crushing

- Decreasing ore Mass or Volume

2) Sintering

As a result of crushing process cleaning furnace

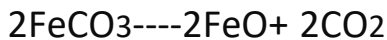
3) Concentrating

- Remove impurities by Magnetic or electric Sep. or surface tension

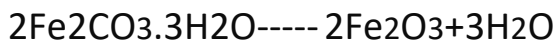
Improving chemical

1) Drying the ore

Convert siderite to hematite

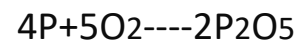
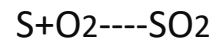


Convert lemonite into hematite



1) Roasting

2) Oxidation of impurities



Reduction of iron ores

Blast furnace

- Reduction by CO results from Coke
- $\text{C} + \text{O}_2 \rightarrow \text{CO}_2$
 $\text{CO}_2 + \text{C} \rightarrow 2\text{CO}$
 $\text{Fe}_2\text{O}_3 + 3\text{CO} \rightarrow 2\text{Fe} + 3\text{CO}_2$

Midrex furnace

- Reduction by water gas ($\text{CO} + \text{H}_2$)
Resulting from Methane gas CH_4
 $2\text{CH}_4 + \text{CO}_2 + \text{H}_2\text{O} \rightarrow \text{CO} + 5\text{H}_2$
- $\text{Fe}_2\text{O}_3 + 3\text{CO} + 3\text{H}_2 \rightarrow 4\text{Fe} + 3\text{CO}_2 + 3\text{H}_2\text{O}$

Iron production

After reduction of iron ores in the furnaces the 3rd step is the production of different types

- of iron such as cast iron and steel
- Oxygen converter
 - Open-hearth
 - Electric furnace