

Carbonization of coal

Carbonization : is a process in which coal is heated in the absence of oxygen. After combustion, carbonization of coal is the most important use of coal to produce coke.

Coke : is the solid residue that remains when coal is heated out of contact with air.

Principal use : Coke is basically formed, so that it can be used in iron and steel manufacture (metallurgical purpose) where it provides heat energy and acts as a reducing agent for iron ore in blast furnace.

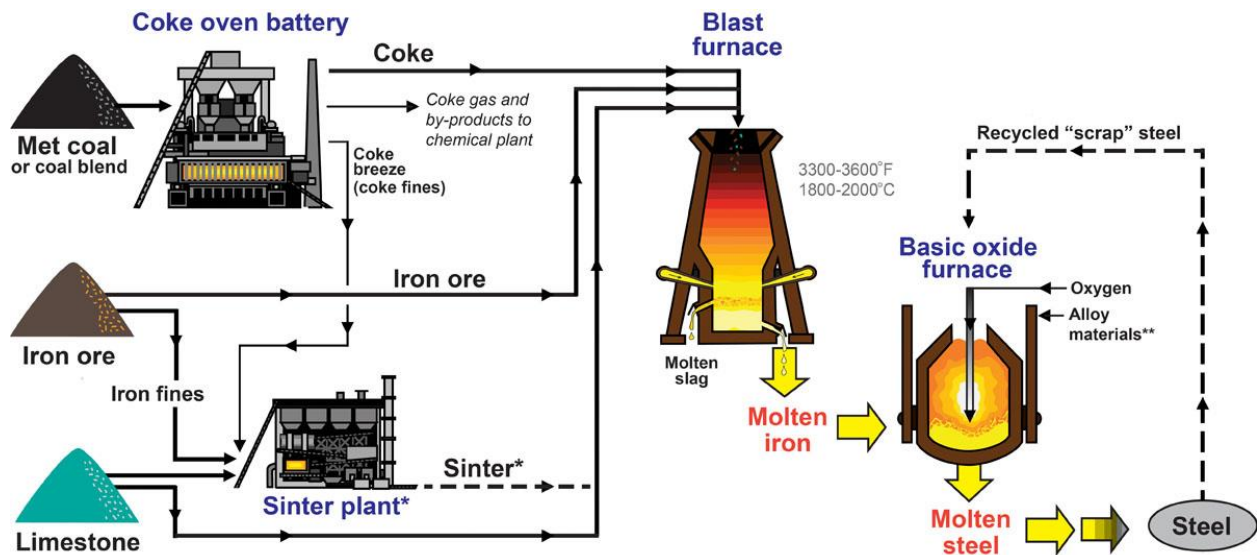


Fig .1

The residue from the carbonization process is a non-porous powder or granular mass, it is known as char.

Char may be used in the form of specially moulded briquettes, in much the same way as coke.

Carbonization can broadly be divided into two types depending on the temperature of carbonization as follows :

High Temperature Carbonization : (900^oc – 1300^oc) Coke is produced for metallurgical purpose. In high temperature carbonization, the yield of gaseous product is more than liquid products with production of tar relatively low.

Low Temperature Carbonization : (400⁰C – 700⁰C) The main aim of low temperature carbonization is to produce soft coke as a smokeless fuel.

Blast furnaces usually require coke of uniform size with high mechanical strength, porosity and minimum ash content and volatile matter.

Fig.1 is very simple laboratory illustration of how you can produce coke out of powdered coal when you heat it, coal gas escapes out through the side tube, coal tar produced settles down at the bottom of the second tube and ammonia gas dissolves in water. What's left in the first tube is nothing but coke.