WEEK: EIGHT (8)

DATE:

CLASS: JSS 2

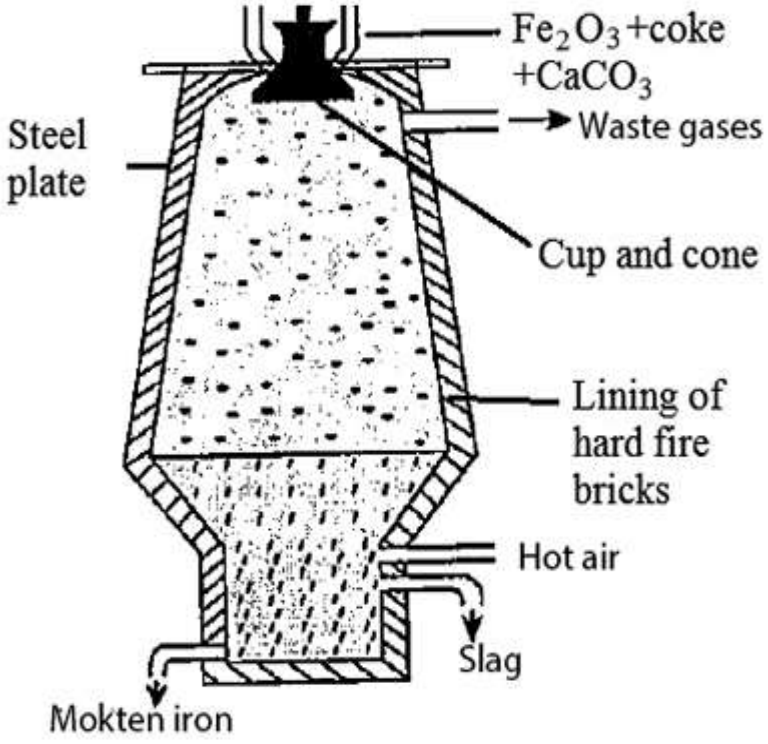
TOPIC: PROCESSING OF MATERIALS (METALS)

PROCESSING OF MATERIALS (METALS

Metals such as iron, copper, and aluminum, all start out as ores, which must be processed to produce the actual material (iron). This is done in the refinery.

METHODS OF PRODUCING METALS.

1. **Smelting:** This involves the heating up of metal ore in special furnace called **blast furnace**. The heat causes the metal to melt and separate from its' ore. It is then allowed to cool and solidify before it is used.



2. **Casting:** This involves the reheating of purified iron to melting point and then pouring it into molds or casts to make cast iron products. Casting is done in a **foundry**.

QUENCHING, HARDENING AND TEMPERING

Quenching means to rapidly cool a heated iron product to make it hardened. This process usually produces a hard but brittle material. Water or oil can be used to quench.

Hardening simply means to make solid or stronger an iron product.

Tempering is a hardening process which involves gradual heating and cooling of an iron product. This usually makes the iron product very strong and not brittle.

Cold Working: This involves the changing of shape of an iron product without heating it.

ALLOYS

An alloy is a metal that is a combination of two or more elements, at least one of which a metal.

SOME ALLOYS, THEIR COMPOSITION AND USES

Sn	Alloys	Composition	Uses
1.	Amalgon	Mercury 50%, other metals 50%	Dentistry, Gold extraction
2.	Babbit Metal	Tin 90%, Antimony 7%, Copper 3%	Bearings, low friction resistance
3.	Bell metal	Copper 77%, Tin 23%	Casting bells
4.	Brass	Copper 50% or more, Zinc 50% or less.	Jewelry, plumbing, fittings.
5.	Bronze	Copper 88%, Tin 12%	Coins, heavy gears, Status
6.	Duraluminum	Aluminium 93.5%, Copper 4.4%, Manganese 1.5%, Magnesium about 0.6%	Air craft, motor car, industrial uses
7.	Pewter	85% Tin, The rest usually copper	Household items especially Mugs, jugs, etc.
8.	Phosphorus Bronze	Bronze, with little phosphorus	Springs, electrical industries, Boat propeller,
9.	Solder Metal	Lead 50%, Tin 50%	Joining metal wires and pieces of metals.
10.	Stainless Steel	Iron 89.5%, Chrome 10.5%, Trace Metals tiny amount	Surgical instruments, cutlery, motor car inducting, anywhere high-grade steel is needed
11.	Sterling Silver	Silver 92.5%, Copper 7.5%	

THE ROLE OF CARBON IN THE PRODUCTION OF METALS

In alloying, carbon plays a very important role with respect to determining how hard or mild the alloy will become.

We have high carbon steels (toolsteel, cast iron,) which are hard and strong. Addition of carbon improves hardenability, but carbon also increases brittleness and reduces weldability because of its tendency to form martensite.

ASSIGNMENT

List any five differences between plastic and rubber.