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Heat treatment of alloys:

The process of heating and cooling of solid steel under controlled condition. At the time of heat treatment, only change physical properties of metal (or) alloy but not chemical properties.

Types of heat treatment of alloy:

(i) Annealing:

Annealing means softening i.e the metal heated to high temperature and slowly cooling in a furnace (absence of air)

Types of annealing:

1. Low temperature annealing
2. High temperature annealing.

Low temperature annealing:

The steel heated to below the critical temperature and followed by slow cooling in furnace.

High temperature annealing:

The steel heated to above the critical temperature and followed by slow cooling in furnace.

Purpose:

- (ii) Increase the ductility and machinability.
- (iii) Reduce the hardness.

(iv) Hardening (or) Quenching:

The steel heated to beyond the critical temperature and then suddenly dipped into oil (or) fluid.

Purpose:

1. Increase resistance to wear.
2. Increase abrasion resistance.
3. Increase the strength.



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(v) Tempering:

The already hardened steel heated to lower the critical temperature (or) own hardening temperature and slowly cooled (Blow redness).

Purpose:

1. It reduces the brittleness.
2. Increase the ductility and malleability.
3. Increase the strength and hardness.

(vi) Normalising:

The steel heated to above the critical temperature and followed by slow cooling in air.

Purpose:

1. Increase the toughness.
2. Recover the uniform of the steel.
3. It removes the internal stresses.

(vii) Carburizing:

1. The steel article taken in a iron box.
2. Iron box consist of charcoal.
3. Then Iron box heated about 950°C.
4. Then slowing cooled.
5. The steel article absorbed charcoal in the outer layer.
6. The outer layer of steel article converted into high carbon steel.

Purpose:

To produce hard wearing surface on steel article.

(vi) Nitriding:

Heating the metal in presence of NH_3 at 550°C. The nitrogen dissociated from ammonia and combine with surface of the metal to form hard nitride.

Purpose:

To get very hard surface