# Heat Treatment of Metals

# MSE-S305

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# Fe-$Fe_3C$ metastable phase diagram

➢**The composition axis extends only to *6.67 wt% carbon*, at this concentration the intermediate compound (*$Fe_3C$ or cementite*) is formed so Fe-$Fe_3C$ phase diagram can be divided into two parts:**

- **Iron - rich portion *(upto 6.67 wt% carbon)***

- **Carbon - rich portion *(6.67 wt% carbon to 100 wt% carbon)* or *pure graphite*.**

➢**A portion of the Fe-C diagram or more decidedly the *Fe-$Fe_3C$* phase diagram is an important one *(from pure Fe to 6.67 wt.% C)*.**

# Fe-$Fe_3C$ metastable phase diagram

- ***6.67 wt%* carbon corresponds to *100 wt%* cementite.**

- **This phase diagram represented the full range of iron-carbon system covering both *Steel* and *Cast Iron*.**

- **Compositions upto *2.1 wt%* C are called *Steels*.**

- **Ferrous alloy contains *more than 2.1 wt%* C are called *Cast Irons*.**

# Fe-$Fe_3C$ metastable phase diagram