**Homework #7**

**Iron Carbon System**

**MEMT 201**

1. You have a 1.0 Kg sample of austenite containing 1.15 wt% Carbon that is cooled to just below 727 dec C. (1341 deg F). What is the pro-eutectoid phase?

Fe3C, because the carbon content is greater than the eutectoid content.

How many Kg of ferrite and cementite are formed?

Wα = (6.7 – 1.15)/(6.7-0.022) = 0.83 \* 1.0 Kg = 0.83 Kg

WFe3C = (1.15 – 0.022)/(6.7-0.022) = 0.17 \* 1.0 Kg = 0.17 Kg

How many Kg of Pearlite and pro-eutectoid phase are formed?

Wp = (6.7 – 1.15)/(6.7 – 0.76) = 0.93 \* 1.0 Kg = 0.93 Kg

Wpro-Fe3C = (1.15 – 0.76)/(6.7 – 0.76) = 0.65 \* 1.0 Kg = 0.65 Kg

Sketch and label the microstructure formed.

Wpro-Fe3C : proeutectoid Fe3C phase

Pearlite Wp

Fe3C

Fe3C

α

1. You have a steel alloy with a 1.00 wt% carbon content that is cooled to room temperature. What is the eutectoid cementite content of this sample?

Cpro-Fe3C = (1.0 – 0.76)/(6.7 – 1.08) = 0.043 = 4.3%

Cα-Fe3C = CFe3C – Cpro-Fe3C = [(1.0 – 0.022)/(6.7-0.022)] – 0.043 = 0.10 = 10%