Assignment #19

9.54 *What is the proeutectoid phase for an iron–carbon alloy in which the mass fractions of total ferrite and total cementite are 0.92 and 0.08, respectively? Why?*

9.55 *Consider 1.0 kg of austenite containing 1.15 wt% C and cooled to below 727°C (1341°F).*

(a) What is the proeutectoid phase?

(b) How many kilograms each of total ferrite and cementite form?

(c) How many kilograms each of pearlite and the proeutectoid phase form?

(d) Schematically sketch and label the resulting microstructure.

9.59 *The microstructure of an iron–carbon alloy consists of proeutectoid ferrite and pearlite; the mass fractions of these two microconstituents are 0.286 and 0.714, respectively. Determine the concentration of carbon in this alloy.*

9.71 *A steel alloy is known to contain 97.5 wt% Fe, 2.0 wt% Mo, and 0.5 wt% C.*

(a) What is the eutectoid temperature of this alloy?

(b) What is the eutectoid composition?

(c) What is the proeutectoid phase?

Assume that there are no alterations in the positions of other phase boundaries with the addition of Mo.