

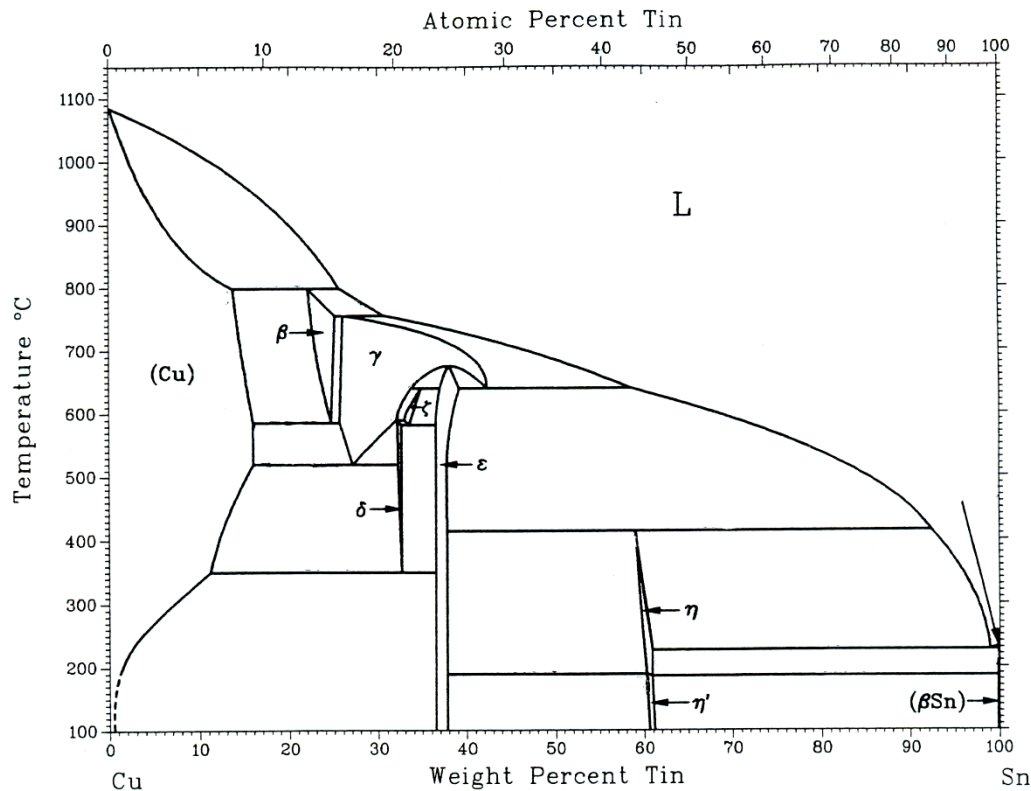
Lesson 07: Phase diagrams

Relevant exercises from the Callister Rethwisch book (10th Global edition)

9.6 (but not d; note, the answer given in the answer to selected problems section in the textbook is in error) + 9.9 (it will be smart to work on both exercises simultaneously), 9.8, 9.12 (not c), 9.18, 9.24

Exercise 07.1 Cu-Sn (Bronze)

The figure shows the phase diagram of the system copper – tin (Cu – Sn).



a) What is the maximum solubility of tin in solid copper?

For the following questions, consider 2,1 kg of a Cu-alloy with 9 weight% Sn.
Assume that the alloy is cooled slowly from 1100°C.

- At which temperature starts solidification of the melt, i.e. at which temperature do the first crystals form?
- Which solid phase is formed first and which chemical composition does it have?
- At which temperature is solidification finished?
- How many phase(s) are present at 400°C? Specify these phase(s).
- What is the chemical composition of the phase(s) at 400°C?
- What are the masses of the phase(s) at 400°C?
- Which phase(s) are present at 250°C?
- What is the chemical composition of the phase(s) at 250°C?
- What are the masses of the phase(s) at 250°C?