Lecture 36

Example Binary Phase Phase Diagrams

Example Phase Diagrams

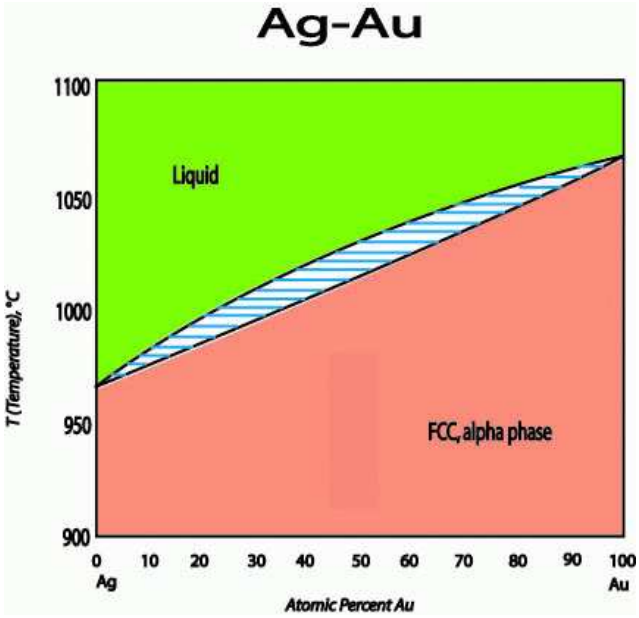

Figure 36-1: Phase diagram for Silver-Gold is a simple lens type. It shows that–at least for temperatures above 900°C– the FCC phase shows complete solid solubility.

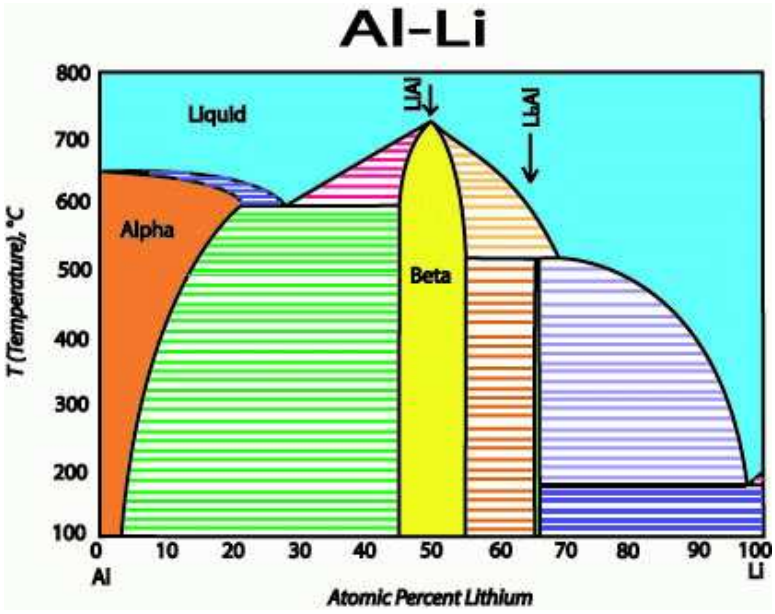

Figure 36-2: Phase diagram for light, stealthy metals, Aluminum-Lithium. There are five phases illustrated; however the BCC Lithium end-member phase shows such limited Aluminum solubility that it hardly appears on this plot. There are two eutectics and one peritectoid reactions. The LiAl (β) and Li_2Al intermetallic phases are ordered compounds where the atoms order on sublattices, thus changing the symmetry of the material. The ordered phases show limited solubility where, for instance, the extra Li will occupy sites where an Al usually sits, or occupies an interstitial position.

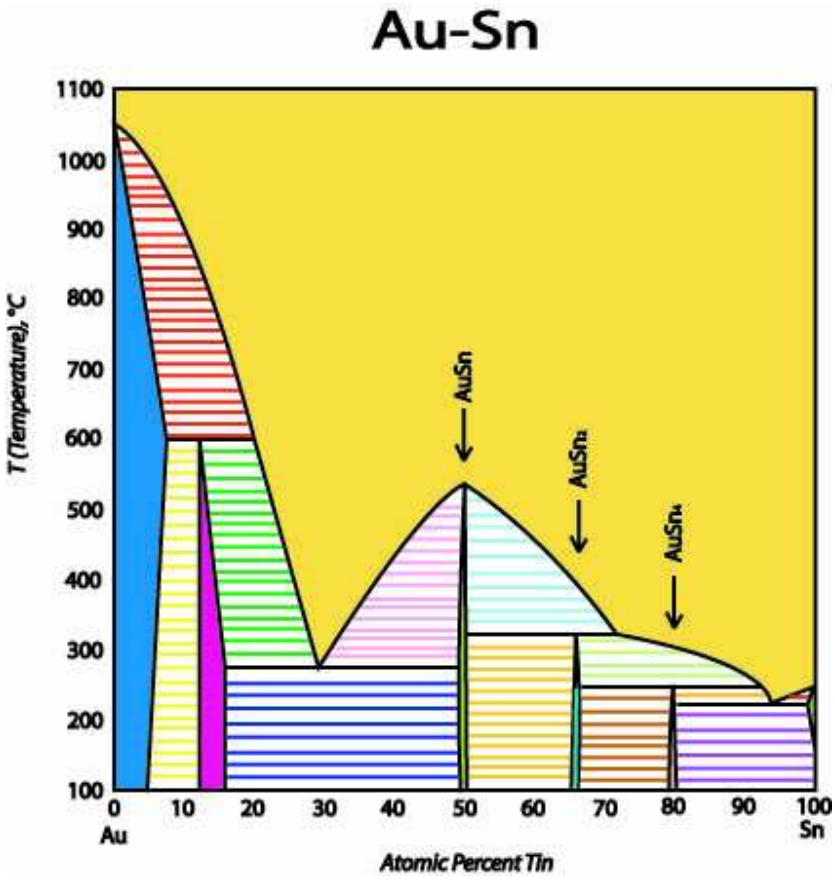

Figure 36-3: Phase diagram for Gold-Tin has seven distinct phases, three peritectics, two eutectics, and one eutectoid reactions.

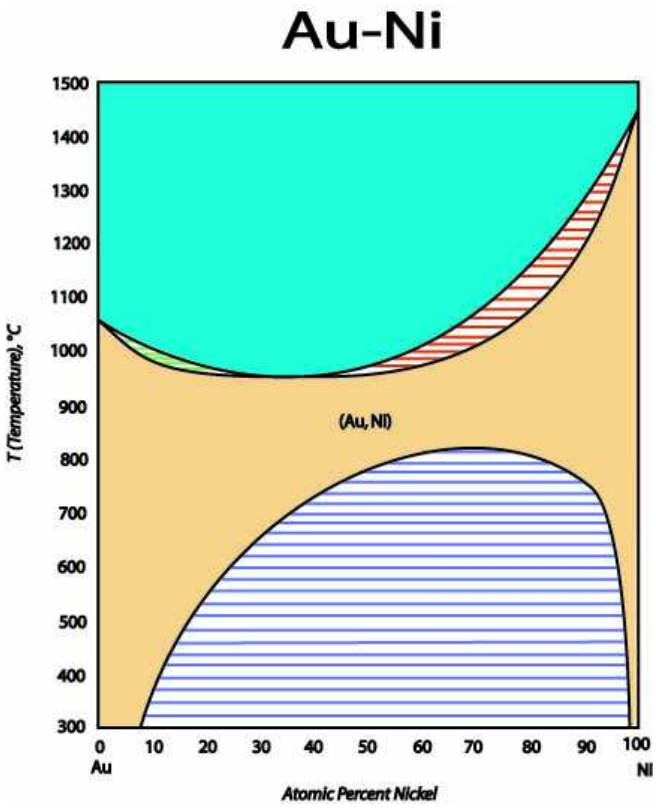

Figure 36-4: Phase diagram for Gold-Nickel showing complete solid solubility above about 800°C and below about 950°C. The miscibility gap at low temperatures can be understood with a regular solution model.