Metallic Materials

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1.1

A Pb–60 at% Sn alloy was slowly cooled from 380°C to 50°C. Calculate the volume fraction of the primary phase at 50řC.

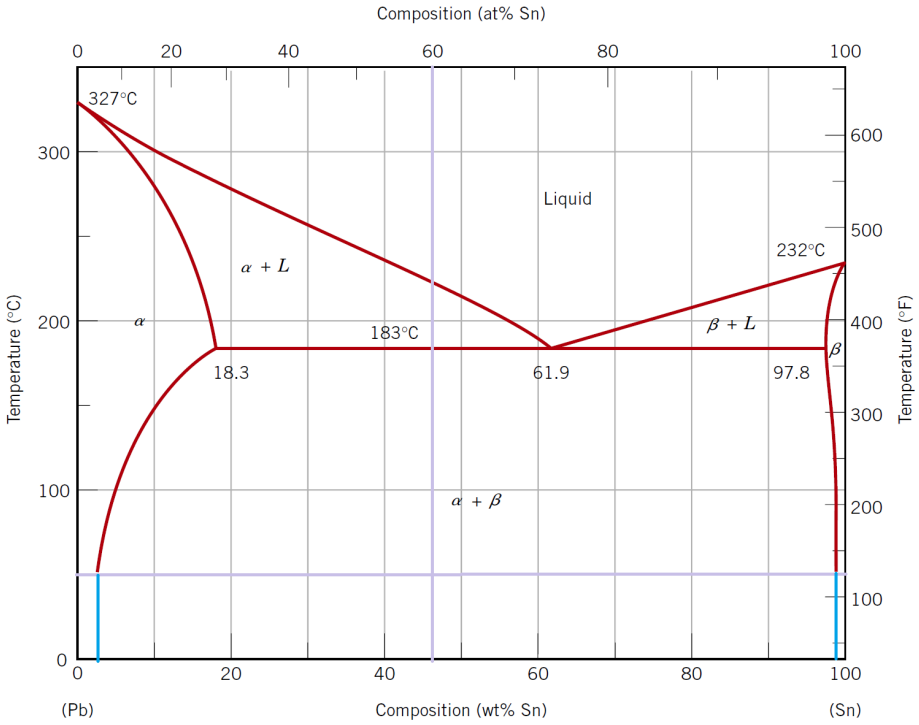

Figure 1: a) Diffusion coefficient D (m^2/s) as a function of temperature T (K) and b) logarithm of the diffusion coefficient $ln(D)$ as a function of the inverse of the temperature $1/T$ (K^{-1}) for self-diffusion systems.
*Source: Data from (**?**), visualization by the author (code available at ()).*

1.2

A Pb–25 at% Sn alloy was slowly cooled from 380°C to 50°C. Ideally, Sn phase is expected to precipitate within Pb-phase grains, but in reality, a eutectic structure appeared. Assuming there were no experimental issues such as weighing errors, discuss the reason why this phenomenon occurred.