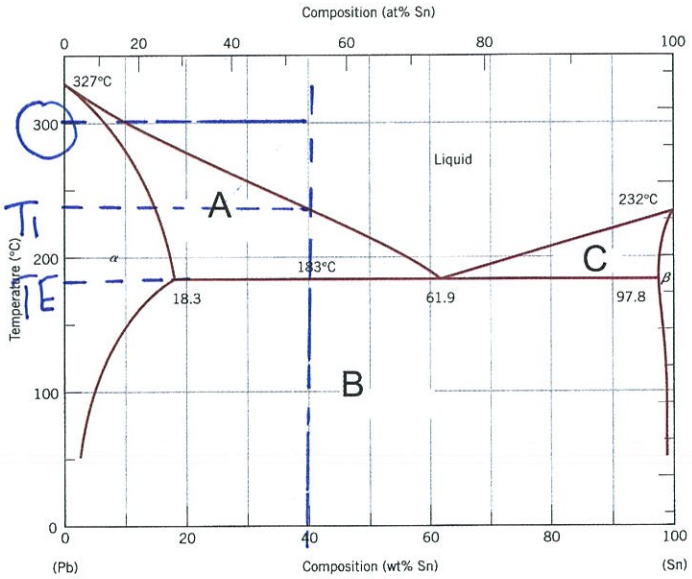
MSE 2001B Quiz #10, 10-30-2015

Your name (print) _____ Your major _____ Score KEY /10

Consider the following questions using the Pb-Sn phase diagram shown below.



1. Label the two-phase regions of phase diagram marked as A, B, and C. (3 pts)

A: α+L, B: α+β, C: β+L +1 pt each

2. What is the maximum solubility of lead (Pb) in tin (Sn)? (1 pts)

∵ Solvent Sn, Solute Pb: ∴ 1−97.8% = 2.2%

3. For the Pb-Sn system, write down the eutectic reaction equation. (2 pts)

→ no composition specified

$L(61.9\ wt\%\ Sn) \rightarrow \alpha(18.3\ wt\%\ Sn) + \beta(97.8\ wt\%\ Sn)$

zero point

4. Sketch the equilibrium cooling curve from the above eutectic to room temperature for the alloy of eutectic composition. (2 pts)

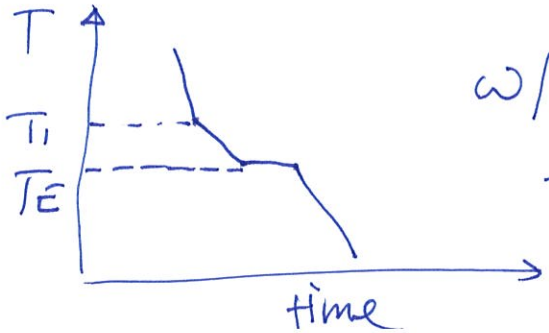
TE : Eutectic temperature

w/o label of TE

+1 pt

5. Sketch the equilibrium cooling curve from 300 °C to room temperature for the alloy of 60% (Pb). (2 pts)

↓ 40%Sn



w/o label of temperature

+1 pt