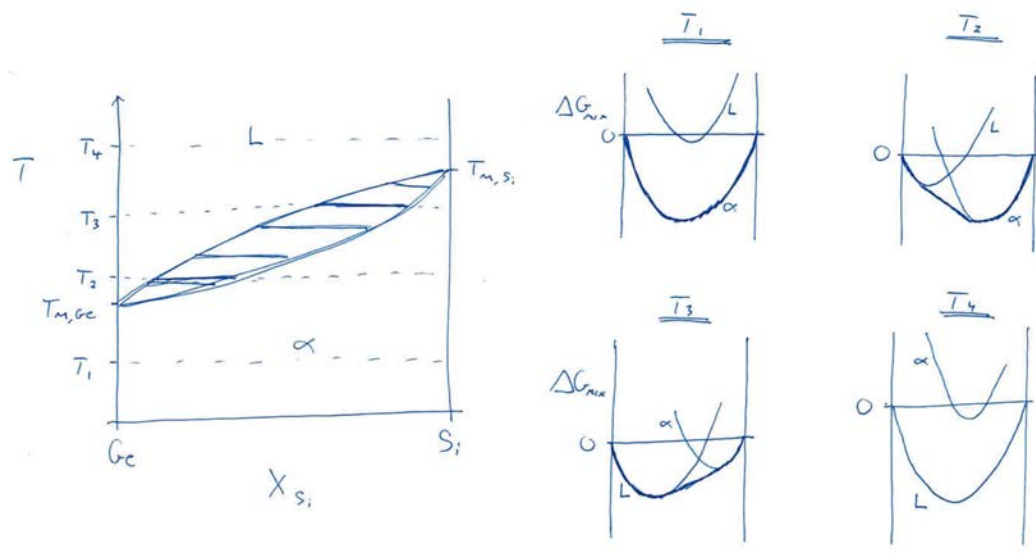


3.020 Lecture 23

Prof. Rafael Jaramillo

1 Taut rope construction

- Consider lens diagram, e.g. Si-Ge



2 Eutectic reactions

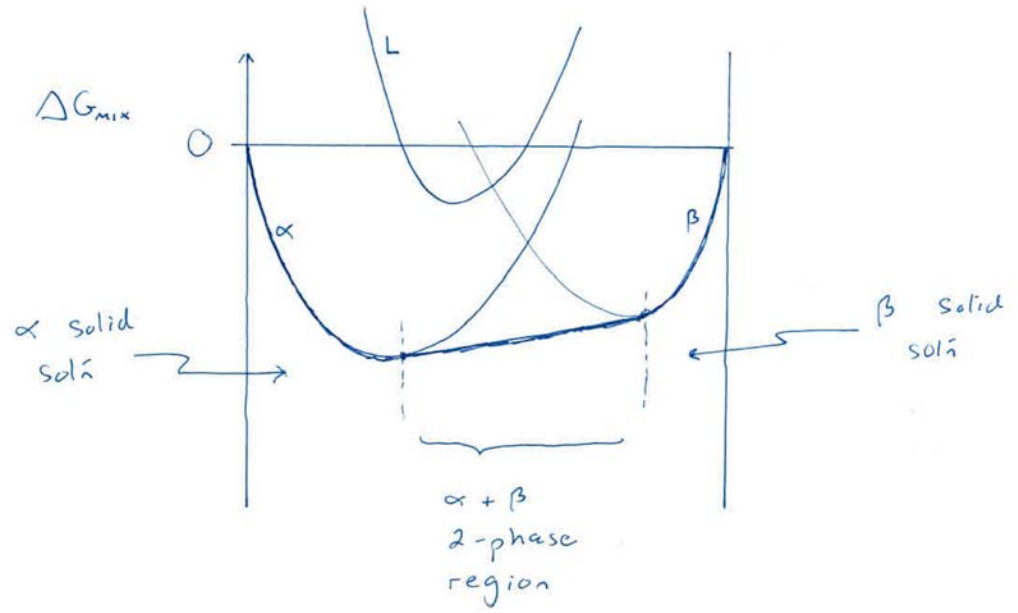


- Eutectic point is a local minimum of the liquidus, at temp T_E
Liquidus = locus of points on binary phase diagram above which only liquid phase is stable
- $DoF = C - Ph + 2 = 1$
- Eutectic point on binary phase diagram becomes a line in (T, P, X_2) higher-dimensional space
- Eutectoid reactions

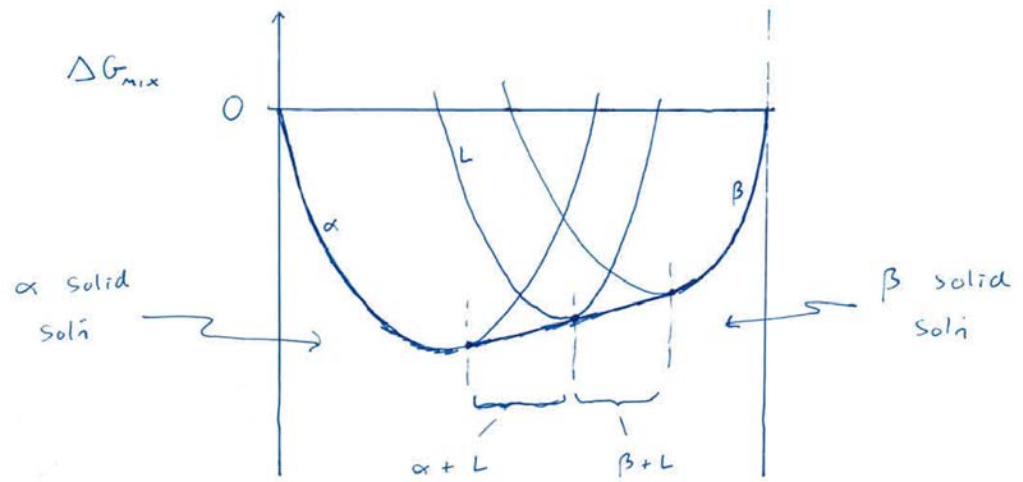


- Free energy-composition diagrams for eutectic systems

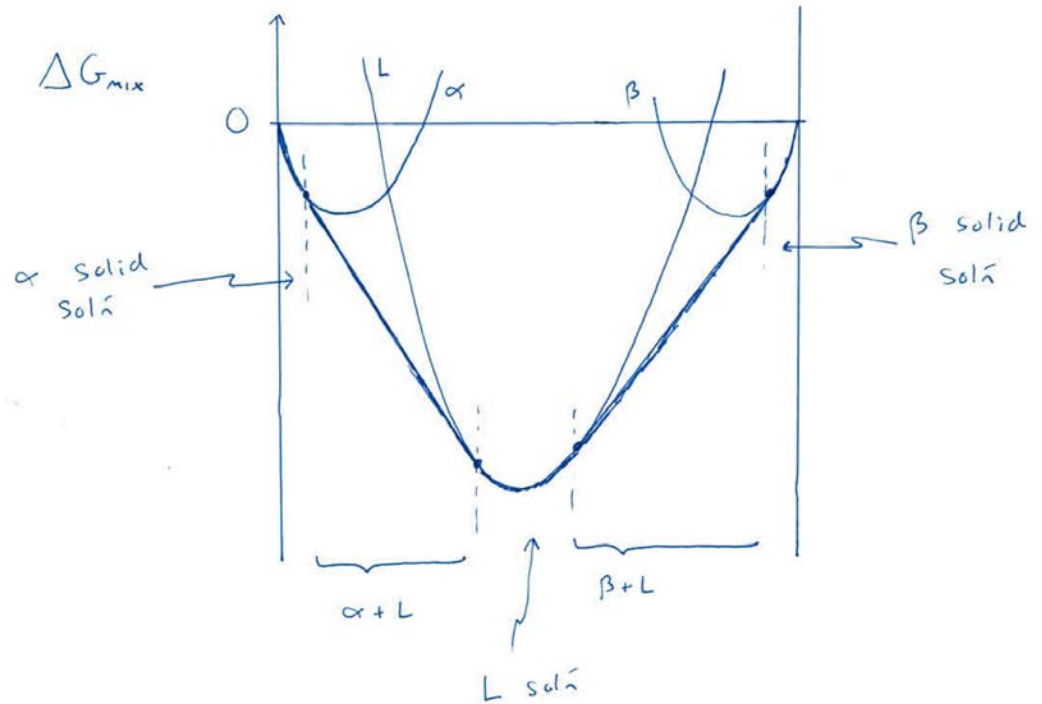
- $T < T_E$: liquid is unstable, and system has two immiscible solid phases



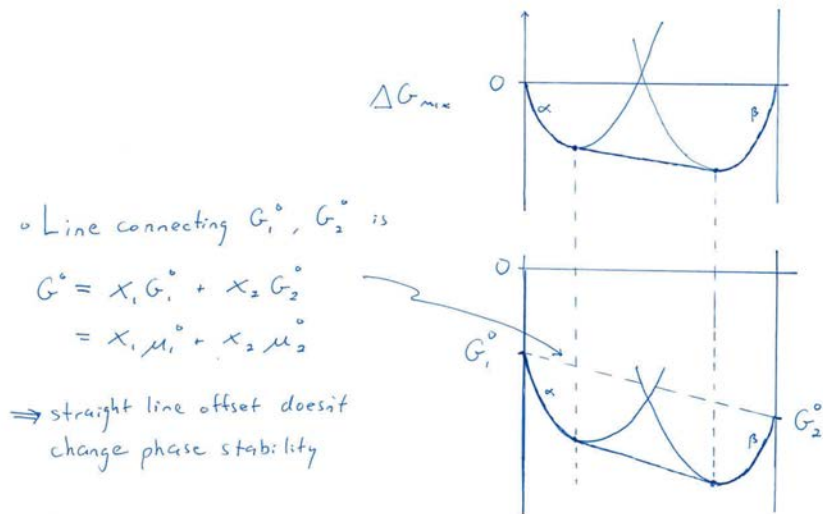
-
- $T = T_E$: liquid phase becomes stable



-
- $T > T_E$: liquid solution stable over a finite composition range



- Plotting ΔG_{mix} or G ?
It doesn't change the resulting taut-rope construction and phase diagram



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3.020 Thermodynamics of Materials
Spring 2021

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