



MT208 Aug. 3:0

Diffusion in Solids

Instructor

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Teaching Assistant

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Department: Materials Engineering

Course Time: Tue., Thu., 9:00-10:30 AM

Lecture venue: Class room (Department of Materials Engineering)

Detailed Course Page:

Announcements

Brief description of the course

This course introduces the basics of solid state diffusion related covering thermodynamics, defects, microstructure and growth kinetics of the phases in an inhomogeneous material system.

Prerequisites

Basics of materials science

Syllabus

Thermodynamics related to phase diagrams, driving forces and defects, Fick's laws of diffusion and solutions, concept of different types of diffusion coefficients, atomic mechanism of diffusion, growth kinetics, the Kirkendall effect, Darken analysis, stable, unstable and multiple Kirkendall planes, role of the Kirkendall effect on morphogenesis, physicochemical approach, multicomponent diffusion.

Course outcomes

Diffusion-controlled phase transformation and microstructural evolution in inhomogeneous material systems

Grading policy

40% mid-terms (2)

60% final exam

Assignments

Resources

1. Shewmon, P., Diffusion in Solids, 2nd Edition, Wiley, 1991
2. A.Paul, T. Laurila, V. Vuorinen, S. Divinsky, Thermodynamics, Diffusion and the Kirkendall effect in Solids, Springer, 2014