

Multicomponent Mass Transfer - Video course

COURSE OUTLINE

After successfully completing the course the student should be able to

1. Appreciate the difference between multicomponent and binary mass transfer.
2. Develop mass transfer relations from Fickian, Maxwell-Stefan, irreversible thermodynamics and lattice approach for gases, liquids and solids.
3. Understand various models of interphase mass transfer and estimate multicomponent mass transfer coefficients.
4. Understand and be able to handle the physical and mathematical complexities involved in multicomponent mass transfer.

Contents

The course can be subdivided in two subheadings viz., Diffusion and Interphase mass transfer.

1. Diffusion:

Maxwell-Stefan's, Fickian, Maxwell-Stefan, Irreversible Thermodynamics and Lattice theory approaches to multicomponent diffusion.

Stoke's-Einstein approach to diffusion in liquids. Estimation of multicomponent Diffusion Coefficients.

2. Interphase mass transfer:

Mass transfer coefficients, bootstrap matrix, Film Theory, Surface renewal models, Mass transfer in drops and bubbles, mass transfer in turbulent flows.

COURSE DETAIL

S.No	Topics	No. of Hours
1	Review of Preliminary Concepts, Definitions.	2
2	Maxwell-Stefan approach for ideal Gases.	8
3	Maxwell-Stefan approach to real gases and liquids.	4
4	Irreversible Thermodynamics approach to diffusion.	2
5	Lattice Theory approach to diffusion	2



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Chemical Engineering

Pre-requisites:

Basics of Mass Transfer, Matrix Algebra and Calculus.

Coordinators:

Dr. Rajesh Khanna
Department of Chemical Engineering IIT Delhi

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E Durkheim



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