NPTEL Video Course - Chemical Engineering - Chemical Reaction Engineering 2 (Heterogeneous Reactors)

Subject Co-ordinator - Prof K. Krishnaiah

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction to Kinetics (Gas solid non-catalytic reaction)
Lecture 2 - Intro to Kinetics (Continued...) for catalytic reactions in different reactors
Lecture 3 - Heterogeneous rate of reactions and different types of kinetic models for non-catalytic reactions
Lecture 4 - Basics of Kinetics of type A & B reactions (Shrinking core model & Porous particle homogeneous mo
Lecture 5 - Shrinking Core Model (Continued...)
Lecture 6 - Shrinking Core Model (Continued...)
Lecture 7 - (Continued...) & Proof of Pseudo steady state assumption
Lecture 8 - Shrinking core model (Continued...) for type D reactions
Lecture 9 - Shrinking core model (Continued...) for type D reactions (Continued...)
Lecture 10 - Reactors, Homogeneous reaction model, Design of non-catalytic gas solid reactors
Lecture 11 - Design of non-catalytic gas solid reactors (Continued...)
Lecture 12 - Design of non-catalytic gas solid reactors (Continued...)
Lecture 13 - Design equation for MF of solids, uniform gas composition, const. single particle size, Shrinkin
Lecture 14 - Design equation for MF of solids, mixture of particles for different sizes but unchanging size,
Lecture 15 - Design equation for MF of solids with elutriation, mixture of particles of different size, unifo
Lecture 16 - General Performance equation for non-catalytic gas solid reactions
Lecture 17 - Catalytic reactions (LHHW Kinetic model)
Lecture 18 - LHHW Kinetic model (Continued...) - Part I
Lecture 19 - LHHW Kinetic model (Continued...) - Part II
Lecture 20 - Industrially important catalytic reaction models
Lecture 21 - Inter and Intraphase effectiveness fator
Lecture 22 - Interface effectiveness factor & Generalized nonisothermal effectiveness factor for external mas
Lecture 23 - Generalized nonisothermal effectiveness factor for external mass transfer step (Continued...)
Lecture 24 - Mass transfer correlations for various reactors
Lecture 25 - Isothermal intraphase effectiveness factor - Part I
Lecture 26 - Isothermal intraphase effectiveness factor - Part II
Lecture 27 - Non-isothermal intraphase effectiveness factor
Lecture 28 - Inter and Intraphase effectiveness factor (Continued...)
Lecture 29 - Inter and Intraphase Mass transfer

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Lecture 30 - Packed (fixed) bed catalytic reactor design
Lecture 31 - Graphical design of Fixed bed reactors
Lecture 32 - Packed Bed Design (Continued...)
Lecture 33 - Design equations for Packed bed reactor design
Lecture 34 - Conservative Equations for Packed bed Reactor design
Lecture 35 - Problem solving session
Lecture 36 - Fluidized Bed Reactor Design - Part I
Lecture 37 - Fluidized Bed Reactor Design - Part II
Lecture 38 - Fluidized Bed Reactor Design - Part III
Lecture 39 - Fluidized Bed Reactor Design - Part IV
Lecture 40 - Continued... (Fluidized bed reactor Models)
Lecture 41 - Continued... (Davidson Harrison model and Kunii Levenspiel model)
Lecture 42 - Continued... (Kunii Levenspiel Model)
Lecture 43 - Slurry Reactor Design
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