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Chemical Process Modelling and Computer Simulation

By Amiya K. Jana



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Chemical Process Modelling and Computer Simulation By Amiya K. Jana

This comprehensive and thoroughly revised text, now in its second edition, continues to present the fundamental concepts of how mathematical models of chemical processes are constructed and demonstrate their applications to the simulation of two of the very important chemical engineering systems: the chemical reactors and distillation systems.

The book provides an integrated treatment of process description, mathematical modelling and dynamic simulation of realistic problems, using the robust process model approach and its simulation with efficient numerical techniques. Theoretical background materials on activity coefficient models, equation of state models, reaction kinetics, and numerical solution techniques needed for the development of mathematical models are also addressed in the book.

The topics of discussion related to tanks, heat exchangers, chemical reactors (both continuous and batch), biochemical reactors (continuous and fed-batch), distillation columns (continuous and batch), equilibrium flash vaporizer, and refinery debutanizer column contain several worked-out examples and case studies to teach students how chemical processes can be measured and monitored using computer programming.

The new edition includes two more chapters Reactive Distillation Column and Vaporizing Exchangers which will further strengthen the text.

This book is designed for senior level undergraduate and first-year postgraduate level courses in Chemical Process Modelling and Simulation. The book will also be useful for students of petrochemical engineering, biotechnology, and biochemical engineering. It can serve as a guide for research scientists and practicing engineers as well.

His areas of research include nonlinear control, modelling and simulation, and energy engineering.

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Editorial Review

About the Author

AMIYA K. JANA (PhD) is Assistant Professor at IIT Kharagpur. He received his BE degree in chemical engineering in 1998 from Jadavpur University, M.Tech. in chemical engineering (specialization: Petroleum Refining Engineering and Petrochemicals) in 2000 from IIT Kharagpur, and PhD in chemical engineering (specialization: Control Systems) in 2004 from IIT Kharagpur.

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