

Topics in chemical engineering Volume 8

# THREE-PHASE SPARGED REACTORS

edited by K. D. P. Nigam and A. Schumpe

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# Three-Phase Sparged Reactors

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# Three-Phase Sparged Reactors

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The subject matter of chemical engineering covers a very wide spectrum of learning and the number of subject areas encompassed in both undergraduate and graduate courses is inevitably increasing each year. This wide variety of subjects makes it difficult to cover the whole subject matter of chemical engineering in a single book. The present series is therefore planned as a number of books covering areas of chemical engineering which, although important, are not treated at any length in graduate and postgraduate standard texts. Additionally, the series will incorporate recent research material which has reached a stage where an overall survey is appropriate, and where sufficient information is available to merit publication in book form for the benefit of the profession as a whole.

Inevitably, with a series such as this, constant revision is necessary if the value of the texts for both teaching and research purposes is to be maintained. I would be grateful to individuals for criticisms and for suggestions for future editions.

R. HUGHES

## Preface

This book is a comprehensive reference text, concentrating on non-agitated three-phase reactors with fluidized solids (*three-phase sparged reactors*), particularly bubble column slurry reactors and three-phase fluidized beds. It provides information on the design and operation of gas/liquid/solid reactors.

Part I covers the fundamental aspects of fluid flow, together with heat, mass and momentum transfer, relevant to all reactors. Along with state-of-the-art reviews, experimental methods for the determination of the design parameters are addressed. While this part is restricted to three-phase sparged reactors, additional reactor types are considered in the case studies in Part II, which is concerned with the analysis of a number of commercially important systems. These contributions have been compiled by authors acting as consultants, or working in industry. The practical examples in Part II of the book illustrate the combination of reaction-specific microkinetics with the macrokinetics derived from Part I.

This book is intended both as a reference text, and to provide an update on three-phase reactor design methodology for industrial and academic researchers.

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We have enjoyed writing our contribution and editing this book and hope that the readers will benefit from this compilation.

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