1. Record Nr. UNICAMPANIASUN0037833

Autore	Golub, Gene H.
Titolo	Matrix computations / Gene H. Golub, Charles F. Van Loan
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Descrizione fisica	XXVII, 694 p. : ill. ; 24 cm.
Altri autori (Persone)	Van Loan, Charles F.
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Lingua di pubblicazione	Inglese
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2. Record Nr. UNINA9911019396103321

Autore	Luyben William L
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ISBN	9786612112652 9781282112650 1282112651 9780470377741 0470377747 9780470377796 0470377798
Descrizione fisica	1 online resource (598 p.)
Altri autori (Persone)	YuCheng-Ching <1956->
Disciplina	660 660.28425 660/.28425
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Formato	Materiale a stampa
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Note generali	Includes index.
Nota di contenuto	REACTIVE DISTILLATION DESIGN AND CONTROL; CONTENTS; PREFACE; 1 INTRODUCTION; 1.1 History; 1.2 Basics of Reactive Distillation; 1.3 Neat Operation Versus Excess Reactant; 1.4 Limitations; 1.4.1 Temperature Mismatch; 1.4.2 Unfavorable Volatilities; 1.4.3 Slow Reaction Rates; 1.4.4 Other Restrictions; 1.5 Scope; 1.6 Computational Methods; 1.6.1 Matlab Programs for Steady-State Design; 1.6.2 Aspen Simulations; 1.7 Reference Materials; PART I STEADY-STATE DESIGN OF IDEAL QUATERNARY SYSTEM; 2 PARAMETER EFFECTS; 2.1 Effect of Holdup on Reactive Trays; 2.2 Effect of Number of Reactive Trays 2.3 Effect of Pressure2.4 Effect of Chemical Equilibrium Constant; 2.5 Effect of Relative Volatilities; 2.5.1 Constant Relative Volatilities; 2.5.2 Temperature-Dependent Relative Volatilities; 2.6 Effect of Number of Stripping and Rectifying Trays; 2.7 Effect of Reactant Feed Location; 2.7.1 Reactant A Feed Location (N(FA)); 2.7.2 Reactant B Feed Location (N(FB)); 2.8 Conclusion; 3 ECONOMIC COMPARISON OF REACTIVE DISTILLATION WITH A CONVENTIONAL PROCESS; 3.1 Conventional Multiunit Process; 3.1.1 Assumptions and Specifications; 3.1.2 Steady-State Design Procedure 3.1.3 Sizing and Economic Equations3.2 Reactive Distillation Design; 3.2.1 Assumptions and Specifications; 3.2.2 Steady-State Design Procedure; 3.3 Results for Different Chemical Equilibrium Constants; 3.3.1 Conventional Process; 3.3.2 Reactive Distillation Process; 3.3.3 Comparisons; 3.4 Results for Temperature-Dependent Relative Volatilities; 3.4.1 Relative Volatilities; 3.4.2 Optimum Steady-State Designs; 3.4.3 Real Chemical Systems; 3.5 Conclusion; 4 NEAT OPERATION VERSUS USING EXCESS REACTANT; 4.1 Introduction; 4.2 Neat Reactive Column; 4.3 Two-Column System with Excess B 4.3.1 20% Excess B Case4.3.2 10% Excess B Case; 4.4 Two-Column System with 20% Excess of A; 4.5 Economic Comparison; 4.6 Conclusion; PART II STEADY-STATE DESIGN OF OTHER IDEAL SYSTEMS; 5 TERNARY REACTIVE DISTILLATION SYSTEMS; 5.1 Ternary System Without Inerts; 5.1.1 Column Configuration; 5.1.2 Chemistry and Phase Equilibrium Parameters; 5.1.3 Design Parameters and Procedure; 5.1.4 Effect of Pressure; 5.1.5 Holdup on Reactive Trays; 5.1.6 Number of Reactive Trays; 5.1.7 Number of Stripping Trays; 5.2 Ternary System With Inerts; 5.2.1 Column Configuration 5.2.2 Chemistry and Phase Equilibrium Parameters5.2.3 Design Parameters and Procedure; 5.2.4 Effect of Pressure; 5.2.5 Control Tray Composition; 5.2.6 Reactive Tray Holdup; 5.2.7 Effect of Reflux; 5.2.8 Chemical Equilibrium Constant; 5.2.9 Feed Composition; 5.2.10 Number of Reactive Trays; 5.2.11 Number of Rectifying and Stripping Trays; 5.3 Conclusion; 6 TERNARY DECOMPOSITION REACTION; 6.1 Ternary Decomposition Reaction: Intermediate-Boiling Reactant; 6.1.1 Column Configuration; 6.1.2 Chemistry and Phase Equilibrium Parameters; 6.1.3 Design Parameters and Procedure 6.1.4 Holdup on Reactive Trays
Sommario/riassunto	After an overview of the fundamentals, limitations, and scope of reactive distillation, this book uses rigorous models for steady-state design and dynamic analysis of different types of reactive distillation columns and quantitatively compares the economics of reactive distillation columns with conventional multi-unit processes. It goes

beyond traditional steady-state design that primarily considers the capital investment and energy costs when analyzing the control structure and the dynamic robustness of disturbances, and discusses how to maximize the economic and environmental benefits of rea