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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
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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
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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