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Nota di contenuto	Cover; Process Integration; Preface; Contents; 1 Introduction to Process Integration; 1.1 Generating Alternatives for Debottlenecking and Water Reduction in Acrylonitrile Process; 1.2 Traditional Approaches to Process Development and Improvement; 1.3 What is Process Synthesis?; 1.4 What is Process Analysis?; 1.5 Why Integration?; 1.6 What is Process Integration?; 1.7 Categories of Process Integration; 1.8 Structure of the Book; 1.9 References; 2 Overall Mass Targeting; 2.1 Targeting for Minimum Discharge of Waste; 2.2 Targeting for Minimum Purchase of Fresh Material Utilities 2.3 Mass-Integratiion Strategies for Attaining Targets2.4 Problems; 2.5 References; 3 Graphical Techniques for Direct-Recycle Strategies; 3.1 Problem Statement; 3.2 Source-Sink Mapping Diagram and Lever-Arm Rules; 3.3 Selection of Sources, Sinks, and Recycle Routes; 3.4 Direct-Recycle Targets Through Material Recycle Pinch Diagram; 3.5 Design Rules from the Material Recycle Pinch Diagram; 3.6 Multicomponent Source-Sink Mapping Diagram; 3.7 Additional Readings; 3.8 Problems; 3.9 References; 4 Synthesis of Mass Exchange Networks: A Graphical Approach; 4.1 Design of Individual Mass Exchangers 4.2 Cost Optimization of Mass Exchangers4.3 Problem Statement for Synthesis of Mass Exchange Networks; 4.4 Mass Exchange Pinch Diagram; 4.5 Screening of Multiple External MSAs and Constructing the

Pinch Diagram without Process MSAs; 4.6 Example - Wastewater Treatment; 4.7 Additional Readings; 4.8 Problems; 4.9 Symbols; 4.10 References; 5 Visualization Techniques for the Development of Detailed Mass-Integration Strategies; 5.1 Low/No Cost Strategies; 5.2 Modest Changes in Process Variables and Operating Conditions; 5.3 Medium-Cost Strategies and Main Technology Changes; 5.4 Problems
5.5 References6 Algebraic Approach to Targeting Direct Recycle; 6.1 Problem Statement; 6.2 Algebraic Targeting Approach; 6.3 Algebraic Targeting Procedure; 6.4 Case Study: Targeting for Acetic Acid Usage in a Vinyl Acetate Plant; 6.5 Problems; 6.6 Symbols; 6.7 References; 7 An Algebraic Approach to the Targeting of Mass Exchange Networks; 7.1 The Composition-Interval Diagram; 7.2 Table of Exchangeable Loads; 7.3 Mass Exchange Cascade Diagram; 7.4 Example on Cleaning of Aqueous Wastes; 7.5 Problems; 7.6 Symbols; 7.7 References; 8 Recycle Strategies Using Property Integration
8.1 Property-Based Material Recycle Pinch Diagram8.2 Process Modification Based on Property-Based Pinch Diagram; 8.3 Example on Solvent Recycle in Metal Degreasing; 8.4 Clustering Techniques for Multiple Properties; 8.5 Cluster-Based Source-Sink Mapping Diagram for Property-Based Recycle and Interception; 8.6 Property-Based Design Rules for Recycle and Interception; 8.7 Dealing with Multiplicity of Cluster-to-Property Mapping; 8.8 Papermaking and Fiber Recycle Example; 8.9 Relationship between Clusters and Mass Fractions; 8.10 Additional Readings; 8.11 Problems; 8.12 Symbols; 8.13 References
9 Heat Integration

Sommario/riassunto

With growing global competition, the process industries must spare no effort in insuring continuous process improvement in terms of Increasing profitability; Conservation of resources and Prevention of pollution The question is how can engineers achieve these goals for a given process with numerous units and streams? Until recently conventional approaches to process design and operation put emphasis only on individual units and parts of the process. A more powerful integrated approach was lacking. The new field of Process Integration looks towards the processing plant