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Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	1 Introduction to Sustainability, Sustainable Design, and Process Integration; What is Sustainability?; What is Sustainable Design Through Process Integration; Motivating Examples on the Generation and Integration of Sustainable Design Alternatives; Structure and Learning Outcomes of the Book; References; 2 Overview of Process Economics; Cost Types and Estimation; Depreciation; Break-Even Analysis; Time-Value of Money; Profitabilty Analysis; Homework problems; References 3 Benchmarking Process Performance Through Overall Mass TargetingStoichiometry-Based Targeting; Mass-Integration Targeting; Mass Integration Strategies for Attaining the Targets; Homework problems; References; 4 Direct-Recycle Networks: A Graphical Approach; Problem Statement for the Design of Direct-Recycle Networks; Selection of Sources, Sinks, and Recycle Routes; Direct-Recycle Targets through Material Recycle Pinch Diagram; Design Rules from the Material Recycle Pinch Diagram; Extension to the Case of Impure Fresh; Insights for Process Modifications

The Source-Sink Mapping Diagram for Matching Sources and SinksMulticomponent Source-Sink Mapping Diagram; Homework problems; References; 5 Synthesis of Mass-Exchange Networks: A Graphical Approach; Mass-Exchange Network Synthesis Task; The MEN-Targeting Approach; The Corresponding Composition Scales; The Mass-Exchange Pinch Diagram; Constructing Pinch Diagrams without Process MSAs; Construction of the Men Configuratiovn with Minimum Number of Exchangers; Trading Off Fixed Cost versus Operating Cost; Homework Problems; Nomenclature; References; 6 Combining Mass-Integration Strategies
Process Representation from a Mass-Integration Species PerspectiveHomework Problems; References; 7 Heat Integration; HEN-Synthesis Problem Statement; Minimum Utility Targets via the Thermal Pinch Diagram; Minimum Utility Targets Using the Algebraic Cascade Diagram; Screening of Multiple Utilities Using the Grand Composite Representation; Stream Matching and the Synthesis of Heat-Exchange Networks; Homework Problems; Nomenclature; References; 8 Integration of Combined Heat and Power Systems; Heat Engines; Steam Turbines and Power Plants
Placement of Heat Engines and Integration with Thermal Pinch AnalysisHeat Pumps; Closed-Cycle Vapor-Compression Heat Pumps Using a Separate Working Fluid (Refrigerant); Vapor-Compression Heat Pumps and Thermal Pinch Diagram; Open-Cycle Mechanical Vapor Recompression Using a Process Stream as the Working Fluid; Absorption Refrigeration Cycles; Cogeneration Targeting; Additional Readings; Homework Problems; References; 9 Property Integration; Property-Based Material Recycle/reuse Pinch Diagram; Process Modification Based on Property-Based Pinch Diagram; Clustering Techniques for Multiple Properties.

Sommario/riassunto

A professional reference that shows how mass integration techniques are used to maximise efficiency and sustainability and minimize the pollution of process systems and plants. Plant and unit operations professionals will save time and money by using the detailed tools and applications as part of their understanding of systematic process development. More generally it will be an important resource for those working with what commonly referred to as P2 (Pollution Prevention) technology.In addition to practitioners developing new systems and, more commonly, retrofitting old systems, the