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Nota di contenuto	MEMBRANE PROCESS DESIGN USING RESIDUE CURVE MAPS; CONTENTS; PREFACE; ACKNOWLEDGMENTS; NOTATION; ABOUT THE AUTHORS; 1 INTRODUCTION; 2 PERMEATION MODELING; 2.1 DIFFUSION MEMBRANES; 2.1.1 Gas Separation; 2.1.2 Pervaporation; 2.2 MEMBRANE CLASSIFICATION; 3 INTRODUCTION TO GRAPHICAL TECHNIQUES IN MEMBRANE SEPARATIONS; 3.1 A THOUGHT EXPERIMENT; 3.2 BINARY SEPARATIONS; 3.3 MULTICOMPONENT SYSTEMS; 3.3.1 Mass Balances; 3.3.2 Plotting a Residue Curve Map; 4 PROPERTIES OF MEMBRANE RESIDUE CURVE MAPS; 4.1 STATIONARY POINTS; 4.2 MEMBRANE VECTOR FIELD; 4.3 UNIDISTRIBUTION LINES 5.3.5 Operating Regions: Selective Membranes5.4 PERMEATION TIME;

5.5 CONTINUOUS MEMBRANE OPERATION; 5.5.1 Nonreflux Equipment; 5.5.2 Reflux Equipment; 5.6 CONCLUSION; 6 COLUMN PROFILES FOR MEMBRANE COLUMN SECTIONS; 6.1 INTRODUCTION TO MEMBRANE COLUMN DEVELOPMENT; 6.1.1 Relevant Works in Membrane Column Research; 6.2 GENERALIZED COLUMN SECTIONS; 6.2.1 The Difference Point Equation; 6.2.2 Infinite Reflux; 6.2.3 Finite Reflux; 6.2.4 CPM Pinch Loci; 6.3 THEORY; 6.3.1 Membrane Column Sections; 6.3.2 The Difference Point Equation for an MCS; 6.3.3 Permeation Modeling; 6.3.4 Properties of the DPE  
6.4 COLUMN SECTION PROFILES: OPERATING CONDITION 1 6.4.1 Statement; 6.4.2 Mathematics; 6.4.3 Membrane Residue Curve Map; 6.5 COLUMN SECTION PROFILES: OPERATING CONDITION 2; 6.5.1 Statement; 6.5.2 Mathematics; 6.5.3 Column Profile; 6.5.4 Analysis; 6.5.5 Pinch Point Loci; 6.5.6 Further Column Profiles; 6.5.7 Direction of T; 6.5.8 Direction of Integration; 6.5.9 Crossing the MBT Boundary; 6.6 COLUMN SECTION PROFILES: OPERATING CONDITIONS 3 AND 4; 6.6.1 Statement; 6.6.2 Mathematics; 6.6.3 Column Profile; 6.6.4 Pinch Point Loci; 6.6.5 Analysis of Column Profile; 6.6.6 Pinch Point 6.6.7 Further Column Profiles 6.6.8 Variations in X and r; 6.7 APPLICATIONS AND CONCLUSION; 7 NOVEL GRAPHICAL DESIGN METHODS FOR COMPLEX MEMBRANE CONFIGURATIONS; 7.1 INTRODUCTION; 7.2 COLUMN SECTIONS; 7.2.1 Definition; 7.2.2 The Difference Point Equation; 7.2.3 Vapor-Liquid Equilibrium and Permeation Flux; 7.2.4 Column Profiles; 7.3 COMPLEX MEMBRANE CONFIGURATION DESIGNS: GENERAL; 7.3.1 Overview; 7.3.2 Petlyuk Membrane Arrangement; 7.3.3 Material Balances; 7.4 COMPLEX MEMBRANE CONFIGURATION DESIGNS: OPERATING CONDITION 1; 7.4.1 Statement; 7.4.2 Mathematics; 7.4.3 Column Profiles 7.4.4 Requirements for Feasibility

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Sommario/riassunto

Design and Synthesis of Membrane Separation Processes provides a novel method of design and synthesis for membrane separation. While the main focus of the book is given to gas separation and pervaporation membranes, the theory has been developed in such a way that it is general and valid for any type of membrane. The method, which uses a graphical technique, allows one to calculate and visualize the change in composition of the retentate (non-permeate) phase. This graphical approach is based on Membrane Residue Curve Maps. One of the strengths of this approach is tha

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