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Nota di contenuto	UNDERSTANDING DISTILLATION USING COLUMN PROFILE MAPS; CONTENTS; PREFACE; NOMENCLATURE AND ABBREVIATIONS; ABOUT THE AUTHORS; 1 INTRODUCTION; 1.1 Context and Significance; 1.2 Important Distillation Concepts; 1.2.1 A Typical Column; 1.2.2 Complex Columns; 1.2.3 Vapor-Liquid Equilibrium; 1.3 Summary; References; 2 FUNDAMENTALS OF RESIDUE CURVE MAPS; 2.1 Introduction; 2.2 Batch Boiling; 2.3 The Mass Balance Triangle (MBT); 2.4 The Residue Curve Equation; 2.4.1 Derivation; 2.4.2 Approximation to Equilibrium; 2.5 Residue Curve Maps; 2.5.1 Constant Relative Volatility Systems; 2.5.2 Nonideal Systems 2.5.3 Numerical Integration2.6 Properties of Residue Curve Maps; 2.6.1 Separation Vector Field; 2.6.2 Stationary Points; 2.6.3 Isotherms; 2.6.4 Other Properties of RCMs; 2.7 Applicability of RCMs to Continuous Processes; 2.7.1 Total Reflux Columns; 2.7.2 Infinite Reflux Columns;

2.7.3 Bow-Tie Regions; 2.7.4 Column Sequencing at Infinite Reflux; 2.8 Limitations of RCMs; 2.8.1 Applications; 2.9 Residue Curve Maps: The Bigger Picture; 2.9.1 Extending the Axes; 2.9.2 Discontinuity; 2.9.3 Thermodynamic Models in Negative Space; 2.9.4 Use of Negative Compositions; 2.10 Summary; References
3 DERIVATION AND PROPERTIES OF COLUMN PROFILE MAPS3.1 Introduction; 3.2 The Column Section (CS); 3.3 The Difference Point Equation (DPE); 3.3.1 The Generalized CS; 3.3.2 Constant Molar Overflow; 3.3.3 Material Balances; 3.4 Column Profile Maps; 3.4.1 Constant Relative Volatility Systems; 3.4.2 Nonideal Systems; 3.5 The Effect of CPM Parameters; 3.5.1 The Net Flow (); 3.5.2 The Difference Point (X); 3.5.2.1 X in CSs with Condensers/ Reboilers; 3.5.2.2 X in General CSs; 3.5.2.3 Individual Component Flows; 3.5.3 The Reflux Ratio (R); 3.6 Properties of Column Profile Maps
3.6.1 The Relationship Between RCMs and CPMs3.6.2 Vector Fields; 3.6.3 Pinch Points; 3.6.4 Isotherms; 3.6.5 Transformed Triangles; 3.7 Pinch Point Loci; 3.7.1 Analytical Solutions; 3.7.2 Graphical Approach; 3.8 Some Mathematical Aspects of CPMs; 3.8.1 Eigenvalues and Eigenvectors; 3.8.2 Nature of Pinch Points; 3.9 Some Insights and Applications of CPMs; 3.9.1 Column Stability; 3.9.2 Node Placement; 3.9.3 Sharp Splits; 3.10 Summary; References; 4 EXPERIMENTAL MEASUREMENT OF COLUMN PROFILES; 4.1 Introduction; 4.2 The Rectifying Column Section; 4.2.1 The Batch Analogy
4.2.2 Experimental Setup and Procedure4.2.2.1 Distillate Addition; 4.2.2.2 Apparatus; 4.2.3 Experimental Results; 4.2.3.1 Stable Node; 4.2.3.2 Saddle Point; 4.3 The Stripping Column Section; 4.4 Validation of Thermodynamic Models; 4.5 Continuous Column Sections; 4.5.1 Apparatus; 4.5.1.1 Column Shell and Packing; 4.5.1.2 Vapor Feed; 4.5.1.3 Liquid Feed; 4.5.1.4 Vapor Exit; 4.5.1.5 Liquid Exit; 4.5.1.6 Sampling Equipment; 4.5.2 Experimental Results; 4.5.3 Temperature Inversion; 4.6 Summary; References; 5 DESIGN OF SIMPLE COLUMNS USING COLUMN PROFILE MAPS; 5.1 Introduction
5.2 Absorbers and Strippers

Sommario/riassunto

Researchers share their pioneering graphical method for designing almost any distillation structure Developed by the authors in collaboration with other researchers at the Centre of Material and Process Synthesis, column profile maps (CPMs) enable chemical engineers to design almost any distillation structure using novel graphical techniques. The CPM method offers tremendous advantages over other design methods because it is generalized and not constrained to a particular piece of equipment. Understanding Distillation Using Column Profile Maps enables readers to un