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Nota di contenuto	Cyclic Separating Reactors; Contents; About the Authors; Preface; Acknowledgments; I: INTRODUCTION; 1 Separating Reactors; 1.1 What are they?; 1.2 Process intensification and multifunctionality; 1.3 Potential advantages of separating reactors; 1.4 The trapping reactor; 1.5 Some examples of separating reactors; 2 Periodic Operation; 2.1 Operation options for periodic separating reactors; 2.1.1 Constraints on options; 2.1.2 Establishing periodic operation; 2.1.3 Reactor type and effect; 2.1.4 Manipulated inputs; 2.2 Characteristics of periodic process; 2.2.1 Cycle structure 2.2.2 Transients and the cyclic stationary state2.2.3 Frequency behavior; 2.2.4 Amplitude behavior; 2.2.5 Phase lag; 2.2.6 Complications; 2.3 Advantages of periodic processes and basis for choice; 2.3.1 Process enhancement; 2.3.2 Process stability; 2.3.3 On-line optimization; 2.3.4 Problems with periodic operation; 2.4 Moving-bed systems; 2.5 Neglect of periodic processes; II: CHROMATOGRAPHIC REACTORS; 3 Introduction to Chromatographic Reactors; 3.1 Concept and types; 3.2 General models; 3.2.1 Distributed systems; 3.2.2 Lumped models; 3.3 Cyclic steady state; 4 Chromatographic Reactors (CR)

4.1 Modeling studies; 4.2 Experimental studies; 4.2.1 Catalyzed chemical reactions; 4.2.2 Enzyme-catalyzed biochemical reactions; 5 Countercurrent Moving-Bed Chromatographic Reactors (CMCR); 5.1 Introduction; 5.2 Modeling studies; 5.3 Experimental studies; 6 Variations on the Moving-Bed Chromatographic Reactor; 6.1 Concept; 6.2 Modeling and design studies; 6.2.1 Continuous rotating annular-bed chromatographic (CRAC) reactors; 6.2.2 Moving bed of adsorbent; 6.2.3 Pulsed, multistage fluidized bed with downward moving adsorbent; 6.3 Experimental studies; 6.3.1 Continuous rotating annular chromatographic (CRAC) reactors; 6.3.2 Moving bed of adsorbent; 7 Simulated Countercurrent Moving-Bed Chromatographic Reactors (SCMCR); 7.1 Concept; 7.2 Isothermal modeling; 7.3 Nonisothermal modeling; 7.4 Separate catalyst and adsorbent beds; 7.5 Experimental studies; 7.5.1 Gas-solid systems; 7.5.2 Liquid-solid systems; 7.5.3 Biochemical systems; 7.6 Nonseparation applications; 8 Chromatographic Reactors: Overview, Assessment, Challenges and Possibilities; 8.1 Overview and assessment; 8.1.1 The chromatographic reactor (CR); 8.1.2 The countercurrent moving-bed chromatographic reactor (CMCR); 8.1.3 Continuous rotating annular-bed chromatographic reactor (CRAC); 8.1.4 Simulated countercurrent moving-bed chromatographic reactors (SCMCR); 8.2 Modeling; 8.3 Design; 8.4 Research needs; 8.5 Research opportunities; 8.5.1 Improving SCMCR performance; 8.5.2 New applications; 8.5.3 Moving-bed design; III: SWING REACTORS; 9 Pressure Swing Reactors; 9.1 Introduction to swing reactors; 9.2 Concepts and types; 9.3 General models for pressure swing reactors; 9.4 Computational considerations; 9.5 Isothermal modeling studies; 9.6 Nonisothermal modeling studies

## Sommario/riassunto

Cyclic Separating Reactors is a critical examination of the literature covering periodically operated separating reactors incorporating an adsorbent as well as a catalyst, aiming to establish the magnitude of performance improvement available with this type of reactor compared to systems in which the reactor and separator are separate units. The adequacy of present models is considered by comparison of simulation and experimental studies, and gaps in understanding or experimental verification of model predictions are identified. Separating reactors, including chromatographic react