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Nota di contenuto	Chemical Micro Process Engineering; Preface; Contents; List of Symbols and Abbreviations; 1 A Multi-faceted, Hierarchic Analysis of Chemical Micro Process Technology; 1.1 Micro-reactor Differentiation and Process Intensification; 1.1.1 Structure or Being Structured? Miniature Casings and Micro Flow; 1.1.2 Symmetry and Unit Cells; 1.1.3 Process Design Dominates Equipment Manufacture and Choice; 1.1.4 Micro-reactor and Chemical-micro-processing Differentiation; 1.1.5 Numbering-up; 1.1.5.1 Progressive Increase in Capacity by Addition of Modules 1.1.5.2 Internal vs. External Numbering-up: Scaling-out of Elements or Devices 1.1.5.3 Issues to be Solved; Problems to be Encountered; 1.1.5.4 Limits of Mini- and Micro Plants for Scale-up; 1.1.5.5 First Large-capacity Numbered-up Micro-flow Devices Reported; 1.1.5.6 First Complete Test Station for Multiple-micro-reactor testing; 1.1.6 Process Intensification; 1.1.6.1 Definitions; 1.1.6.2 Matching Fluidics to Physico-chemical Requirements of a Reaction; 1.1.6.3 Relationship of

and Difference between of PI and Micro-reaction Technology

1.1.6.4 Process Intensification Achieved by Use of Micro Reactors

1.1.7 The Multi-scale Concept; 1.1.8 A Word of Caution on the Probability of

a Deductive Analysis; 1.1.9 Other Concepts Related to or Relevant for

Chemical-Micro Processing; 1.1.9.1 mTAS: Micro Total Analysis

Systems; 1.1.9.2 Green Chemistry; 1.1.9.3 Sustainable Development

and Technology Assessment; 1.1.9.4 Microfluidic Tectonics (FT);

1.1.9.5 Compact Flow-through Turbulent Reactors, also Termed

Microreactor (MR) Technology; 1.1.9.6 Supramolecular Aggregates,

Also Termed Micro Reactors

1.1.10 Some Historical Information on Micro-reactor Evolution

1.1.11 Micro-reactor Consortia/Forums; 1.1.11.1 The Laboratory on a Chip

Consortium (UK); 1.1.11.2 MicroChemTec and IPmVT (D); 1.1.11.3

NeSSI (USA); 1.1.11.4 Micro Chemical Process Technology, MCPT (J);

1.1.11.5 CPAC Micro-reactor Initiative (USA); 1.2 Consequences of

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Impacts for Micro Reactors; 1.2.2 Categories of 'Micro-reactor

Fundaments and Impacts'; 1.2.3 Comprehensive Reviews and Essays

1.2.4 Reviews and Essays on Physical Fundaments and the Impact on

Chemical Engineering and Process Engineering

1.2.5 Reviews and Essays on the Impact on Process Results, Society/Ecology and the Economy;

1.2.6 Reviews and Essays on Application Topics and Microfabrication;

1.2.7 Reviews and Essays on Institutional Work; 1.3 Physical and

Chemical Fundaments; 1.3.1 Size Reduction of Process Equipment;

1.3.2 Scaling Effects Due to Size Reduction: Hydrodynamics; 1.3.3

Chemical Fundaments; 1.4 Impact on Chemical Engineering

1.4.1 Basic Requirements on Chemical Engineering from an Industrial

Perspective

Sommario/riassunto

Micro process engineering is approaching both academia and industry. With the provision of micro devices and systems by commercial suppliers, one main barrier for using these units has been eliminated. More and more they become familiar, thereby being one facet of the upheaval in chemical industry. This book focuses on processes rather than on devices: what is 'before' and 'behind' micro device fabrication. A comprehensive and detailed overview is given on:- A multi-faceted, hierachic analysis of chemical micro process technology- Modelling and simulation of micro reactors- Liq
