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Nota di contenuto	Cover; Related Titles; Title Page; Copyright; Dedication Page; Motivation - Who Should Read the Book!?!; Acknowledgments; Abbreviations; Nomenclature; Chapter 1: From Green Chemistry to Green Engineering - Fostered by Novel Process Windows Explored in Micro-Process Engineering/Flow Chemistry; 1.1 Prelude - Potential for Green Chemistry and Engineering; 1.2 Green Chemistry; 1.3 Green Engineering; 1.4 Micro- and Milli-Process Technologies; 1.5 Flow Chemistry; 1.6 Two Missing Links - Cross-Related; References; Chapter 2: Novel Process Windows 2.1 Transport Intensification - The Potential of Reaction Engineering 2.2 Chemical Reactivity in Match or Mismatch to Intensified Engineering; 2.3 Chemical Intensification through Harsh Conditions - Novel Process Windows; 2.4 Flash Chemistry; 2.5 Process-Design Intensification; References; Chapter 3: Chemical Intensification -

Fundamentals; 3.1 Length Scale; 3.2 Time Scale; 3.3 Length and Time Scale of Chemical Reactions; 3.4 Temperature Intensification; 3.5 Pressure Intensification; References; Chapter 4: Making Use of the "Forbidden" - Ex-Regime/High Safety Processing
4.1 Hazardous Reactants and Intermediates 4.2 Ex-Regime and Thermal Runaway Processing; References; Chapter 5: Exploring New Paths - New Chemical Transformations; 5.1 Direct Syntheses via One Step; 5.2 Direct Syntheses via Multicomponent Reactions; 5.3 Multistep One-Flow Syntheses; 5.4 Multistep Syntheses in One Microreactor/Chip; 5.5 Multistep Syntheses in Coupled Microreactors/Chips; References; Chapter 6: Activate - High-T Processing; 6.1 Tailored High-T Microreactor Design and Fabrication; 6.2 Cryogenic to Ambient - Allowing Fast Reactions to be Fast 6.3 From Reflux to Superheated - Speeding-Up Reactions 6.4 Solvent-Scope Widening by Virtue of Pressurizing Existing High-T Reactions; 6.5 New Temperature Field for Product and Material Control; 6.6 Energy Activation Other than Temperature - Photo, Electrochemical, Plasma; References; Chapter 7: Press - High-p Processing; 7.1 Tailored High-p Microreactor Design and Fabrication; 7.2 High Pressure to Intensify Interfacial Transport in Gas-Liquid Reactions; 7.3 Pressure as Direct Means - Activation Volume Effects and More 7.4 Pressure for Advanced Fluidic Studies - to be Used for Shaping Materials and More References; Chapter 8: Collide and Slide - High-c and Tailored-Solvent Processing; 8.1 Batch Process-Based Inspirations for High-c Flow Processes; 8.2 Solvent-Free or Solvent-Less Operation - "Highest-c"; 8.3 Supercritical Fluids to Combine the Former Separated - Mass Transfer Boost; References; Chapter 9: Doing More by Combining - Process Integration; 9.1 Integration of Reaction and Cooling/Heating, Separation, or Other; 9.2 Integration of Process Control and Sensing
9.3 Thermal Integration on a Process Level

Sommario/riassunto

This book introduces the concept of novel process windows, focusing on cost improvements, safety, energy and eco-efficiency throughout each step of the process. The first part presents the new reactor and process-related technologies, introducing the potential and benefit analysis. The core of the book details scenarios for unusual parameter sets and the new holistic and systemic approach to processing, while the final part analyses the implications for green and cost-efficient processing. With its practical approach, this is invaluable reading for those working in the pharmaceutical, fine
