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Sommario/riassunto	Liquid multiphase processes represent a promising option for realizing novel, efficient, and sustainable production processes, as required for the transformation towards climate-neutral manufacturing processes. This volume presents the results obtained over twelve years in the DFG-funded collaborative project Transregio 63 "Integrated Chemical Processes in Liquid Multiphase Systems". In an interdisciplinary approach to the design and operation of such processes, essential principles of Green Chemistry are realized, such as using long-chain olefins as model representatives of renewable raw materials, highly efficient catalysts, and green solvents, linked with process optimization to improve energy and material efficiency. Experts from different fields addressed all steps of the development process, from the description of the reactions on the molecular level via thermodynamics and the design of efficient separation processes to the operation of entire miniplants for liquid multiphase production processes. Thus, the complete development chain from the first reaction-related investigations in the laboratory to the technological realization in

miniplants with model-based control is demonstrated. Numerous methodological innovations are proposed and validated using several innovative phase systems (thermomorphic multiphase systems, microemulsion systems, Pickering emulsions) and homogeneously catalyzed reactions. Engineers and chemists from the chemical industry as well as advanced students and researchers will get valuable insights into the physico-chemical phenomena in chemical multiphase processes and benefit from recommendations concerning methods for the selection of phase systems and rapid model-based process development.
