Supercritical Fluid Technology for Energy and Environmental Applications

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Supercritical Fluid Technology for Energy and Environmental Applications covers the fundamental principles involved in the preparation and characterization of supercritical fluids (SCFs) used in the energy production and other environmental applications. Energy production from diversified resources - including renewable materials - using clean processes can be accomplished using technologies like SCFs. This book is focused on critical issues scientists and engineers face in applying SCFs to energy production and environmental protection, the innovative solutions they have found, and the challenges they need to overcome. The book also covers the basics of sub- and supercritical fluids, like the thermodynamics of phase and chemical equilibria, mathematical modeling, and process calculations.

A supercritical fluid is any substance at a temperature and pressure above its critical point where distinct liquid and gas phases do not exist. At this state the compound demonstrates unique properties, which can be "fine-tuned," making them suitable as organic solvents in a range of industrial and laboratory processes.

This volume enables readers to select the most appropriate medium for a specific situation. It helps instructors prepare course material for graduate and postgraduate courses in the area of chemistry, chemical engineering, and environmental engineering. And it helps professional engineers learn supercritical fluid-based technologies and use them in solving the increasingly challenging environmental issues.

- Relates theory, chemical characteristics, and properties of the particular supercritical fluid to its various applications
- Covers the fundamentals of supercritical fluids, like thermodynamics of phase and chemical equilibria, mathematical modeling, and process calculations
- Includes the most recent applications of supercritical fluids, including energy generation, materials synthesis, and environmental protection

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