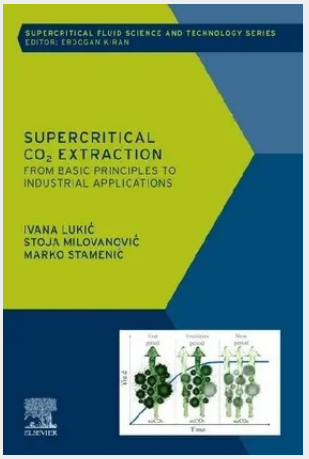
Lukic / Milovanovic

Supercritical CO2 Extraction

From Basic Principles to Industrial Applications Volume 10



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Supercritical fluid extraction (SFE) has become one of the most recognized and widely applied technologies in green processing, with supercritical carbon dioxide (scCO2) leading the way as the fluid of choice. It represents not only the first but also the most established industrial application of supercritical fluids, paving the path from laboratory research to large-scale production. This book, Supercritical CO2 Extraction: From Basic Principles to Industrial Applications, brings together and systematizes the current state of knowledge on scCO2 extraction, offering both a comprehensive overview and practical insights. It begins with an accessible introduction to the unique properties of scCO2, followed by a clear explanation of the principles and operation of SFE. A broad spectrum of applications is then explored, ranging from plant materials to non-plant sources, agricultural residues, and food by-products, highlighting the versatility and growing potential of this technology. In addition to practical case studies, the book addresses modeling strategies and scale-up considerations, providing valuable guidance for translating experimental findings into industrial practice. Special emphasis is placed on integrated processes and real-world examples, showcasing how SFE has successfully bridged the gap between science and industry. The final chapter looks toward the future, outlining the challenges and opportunities that will shape the next generation of scCO2-assisted technologies. The book is intended for master's and PhD students in chemical engineering, biotechnology, food engineering, pharmaceutical sciences, and process engineering. It also serves as an essential resource for industry professionals seeking to understand and apply one of the most promising technologies in sustainable extraction.

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