



Supercritical Fluids: Fundamentals and Applications (Nato Science Series E:)

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Supercritical fluids are neither gas nor liquid, but can be compressed gradually from low to high density and they are therefore interesting and important as tunable solvents and reaction media in the chemical process industry. By adjusting the density the properties of these fluids can be customised and manipulated for a given process - physical or chemical transformation. Separation and processing using supercritical solvents such as CO₂ are currently on-line commercially in the food, essential oils and polymer industries. Many agencies and industries are considering the use of supercritical water for waste remediation. Supercritical fluid chromatography represents another, major analytical application. Significant advances have recently been made in materials processing, ranging from particle formation to the creation of porous materials.

The chapters in this book provide tutorial accounts of topical areas centred around: (1) phase equilibria, thermodynamics and equations of state; (2) critical behaviour, crossover effects; (3) transport and interfacial properties; (4) molecular modelling, computer simulation; (5) reactions, spectroscopy; (6) phase separation kinetics; (7) extractions; (8) applications to polymers, pharmaceuticals, natural materials and chromatography; (9) process scale-up.

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