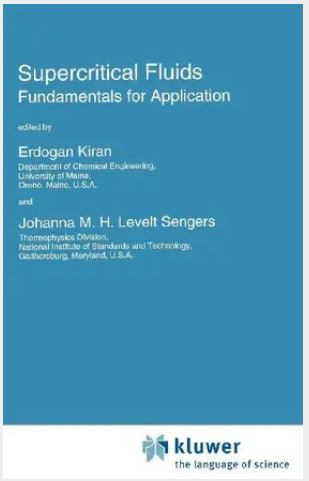
Kiran / Levelt Sengers

Supercritical Fluids

Fundamentals for Application



Supercritical fluids which are neither gas nor liquid, but can be compressed gradually from low to high density, are gaining increasing importance as tunable solvents and reaction media in the chemical process industry. By adjusting the pressure, or more strictly the density, the properties of these fluids are customized and manipulated for the particular process at hand, be it a physical transformation, such as separation or solvation, or a chemical transformation, such as a reaction or reactive extraction. Supercritical fluids, however, differ from both gases and liquids in many respects. In order to properly understand and describe their properties, it is necessary to know the implications of their nearness to criticality, to be aware of the complex types of phase separation (including solid phases) that occur when the components of the fluid mixture are very different from each other, and to develop theories that can cope with the large differences in molecular size and shape of the supercritical solvent and the solutes that are present.

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