



# Phase Equilibrium Engineering: Chapter 9. Green Processes and High-Pressure Solvents (Supercritical Fluid Science and Technology)

*Esteban Brignole, Selva Pereda*

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In this chapter, the problem of sustainability of the chemical and pharmaceutical industries and the principles of green chemistry are outlined. In particular, the need for secure and environmentally safe solvents (ESSs) is pointed out. There are several ESS alternatives under study nowadays, like ionic liquids, polymeric solvents, and simple liquids like fatty esters; however, an increasing attention is being paid to supercritical fluids (SCFs) for a wide variety of applications in the chemical and pharmaceutical as well as in the materials and electronic industry. In the present chapter after an introduction to the fundamentals of SCF extraction, PEE principles are applied to several case studies of SCF—substrate mixtures of natural products with different types of phase behavior. Finally the application of SCF for supercritical micronization is reviewed and a case study is presented.

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