

REVIEW PAPER

## Supercritical fluid technology

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### ABSTRACT

Supercritical fluids (SCFs) are increasingly replacing organic solvents, e.g., *n*-hexane, dichloromethane, chloroform, and so on, that are conventionally used in industrial extraction, purification, and recrystallization operations because of regulatory and environmental pressures on hydrocarbon and ozone-depleting emissions. In natural product extraction and isolation, supercritical fluid extraction (SFE), especially that employing supercritical CO<sub>2</sub>, has become the method of choice. Sophisticated modern technologies allow precise regulation of changes in temperature and pressure, and thus manipulation of solvating property of the SCF, which helps the extraction of natural products of a wide range of polarities. This review deals mainly with the application of the SFE technology in the natural product extraction and isolation, and discusses various methodologies with specific examples. Supercritical fluid (SCF) technology is investigated as a dry technique for photoresist developing. Because of their unique combination of gaseous and liquid-like properties, these fluids offer comparative or improved efficiencies over liquid developers and, particularly carbon dioxide would have tremendous beneficial impact on the environment and on worker safety. Additionally, SCF technology offers the potential for processing advanced resist systems which are currently under investigation as well as those that may have been abandoned due to problems associated with conventional developers. An investigation of various negative and positive systems is ongoing. Initially, supercritical carbon dioxide as a developer for polysilane resists was explored because the exposure products, polysiloxanes, are generally soluble in this fluid. These initial studies demonstrated the viability of the SCF technique with both single layer and bilayer systems. Subsequently, the investigation focused on using SC CO<sub>2</sub> to produce negative images with polymers that would typically be considered positive resists.

**Key Words :** Super critical fluid, Phospholipids, Trace organics, Spices

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