

Solubility of Waxes and Polymers in Supercritical CO₂

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Carnauba wax that is obtained from the leaves of the Brazilian tropical palm tree *Copernicia cerifera*, has been extensively used as a binder in metal injection molding process or powder injection molding process. Carnauba wax consists mainly of aliphatic esters (wax esters), α -hydroxyl esters, and cinnamic aliphatic diesters that can be removed from the green body during the debinding process with supercritical carbon dioxide. Its removal from the green body using supercritical CO₂ requires less time and low temperature than other methods, such as solvent, thermal, and catalytic debinding processes. In this research, effects of temperature, pressure, and co-solvents on the solubility of waxes and polymers were investigated under supercritical CO₂ atmosphere. The solubility of waxes and polymers was measured at high pressures and relatively low temperatures. Solubility increased when chloroform, ethanol or acetone was used as a co-solvent. It was also influenced by temperature and pressure.

Acknowledgment: This research is supported by DG Economic Circle Leading Industry R&D Program of the Ministry of Knowledge and Economy (MOKE) (R0001657).