Production of Completely Dry Ecamsule Microparticles using Supercritical CO_2 as an Antisolvent

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Recently, the supercritical antisolvent (SAS) process has been used to produce micronized organic powders with excellent properties. In this study, we demonstrated that SAS technique with supercritical carbon dioxide ($scCO_2$) as the antisolvent can be used to obtain completely dry and uniform micronized ecamsule powder from dilute ecamsule–ethanol solution with high recovery. The effects of different operating parameters, such as temperature, pressure, initial concentration of ecamsule solution, and solution flow rate on the recovery yield, ethanol removal efficiency, surface morphology, particle size, and chemical, thermal, and textural properties of dry ecamsule powder were investigated. To elucidate the ecamsule precipitation mechanism during the SAS process, the Hansen solubility parameters (HSPs) and relative energy differences were used to analyze the solubility of ecamsule in $scCO_2$–ethanol mixtures under the studied conditions.