

The solubility of ibuprofen in supercritical CO₂ and micronization using supercritical fluid process

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Ibuprofen is a chiral nonsteroidal anti-inflammatory drug that is used to treat arthritis, fever and headaches. But this drug is poor soluble in water and dissolution rate was very slow. The dissolution rate of a drug in the biological environment can be improved by reducing the particle size of the drug. The rapid expansion of supercritical solution (RESS) is process that reduces the particle size using the supercritical fluid. We tried to micronize ibuprofen using RESS process. The solubility of ibuprofen in supercritical fluid was measured prior to perform the RESS process for accurate experiment design. The solubility was measured using variable volume view cell. The solubility result was correlated by the Peng–Robinson equation of state with van der Waals mixing rule. The RESS process was performed to investigate the effects of extraction pressure, temperature and nozzle size. The particle size and morphology were analyzed by the Scanning Election Microscopy and Particle Size Distribution Analyzer.