

## RESEARCH PAPERS

用含夹带剂丙酮的超临界CO<sub>2</sub>快速膨胀法制备灰黄霉素的微细颗粒

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摘要

Griseofulvin (GF) is an antifungal drug whose pharmaceutical activity can be improved by reducing particle size. In this study the rapid expansion of supercritical solution (RESS) was employed to micronize GF. Carbon dioxide with cosolvent acetone was chosen as a supercritical mixed solvent. The solubility of GF in super-critical CO<sub>2</sub> with cosolvent acetone was measured using a dynamic apparatus at pressures between 12 and 32 MPa, temperatures at 313, 323 and 333K and cosolvent concentration at 1.5, 3.0, 4.5 and 6.0% (by mole). The effect of pre-expansion pressure, extraction temperature, spraying distance, nozzle size and concentration of cosolvent on the precipitated particles was investigated. The results show that the mean particle size of griseofulvin precipitated by RESS was less than 1.2 μm. An increase in pre-expansion pressure, extraction temperature, spraying distance and concentration of cosolvent resulted in a decrease in particle size under the operating condition studied. With the decrease of nozzle diameter the particle size reduces. The crystallinity and melting point of the original material and the processed particle by RESS were tested by X-ray diffraction (XRD) and differential scanning calorimetry (DSC). No evident modification in the crystal habit was found under the experimental conditions tested. The morphology of particles precipitated was analyzed by scanning electron microscopy (SEM).

关键词 [griseofulvin](#) [micronization](#) [RESS process](#) [cosolvent](#)

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### Micronization of Griseofulvin by Res in Supercritical CO<sub>2</sub> with Cosolvent Acetone

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**Abstract** Griseofulvin (GF) is an antifungal drug whose pharmaceutical activity can be improved by reducing particle size. In this study the rapid expansion of supercritical solution (RESS) was employed to micronize GF. Carbon dioxide with cosolvent acetone was chosen as a supercritical mixed solvent. The solubility of GF in super-critical CO<sub>2</sub> with cosolvent acetone was measured using a dynamic apparatus at pressures between 12 and 32 MPa, temperatures at 313, 323 and 333K and cosolvent concentration at 1.5, 3.0, 4.5 and 6.0% (by mole). The effect of pre-expansion pressure, extraction temperature, spraying distance, nozzle size and concentration of cosolvent on the precipitated particles was investigated. The results show that the mean particle size of griseofulvin precipitated by RESS was less than 1.2 μm. An increase in pre-expansion pressure, extraction temperature, spraying distance and concentration of cosolvent resulted in a decrease in particle size under the operating condition studied. With the decrease of nozzle diameter the particle size reduces. The crystallinity and melting point of the original material and the processed particle by RESS were tested by X-ray diffraction (XRD) and differential scanning calorimetry (DSC). No evident modification in the crystal habit was found under the experimental conditions tested. The morphology of particles precipitated was analyzed by scanning electron microscopy (SEM).

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