

论文

超临界二氧化碳制备布地奈德-聚氧乙烯固体分散体及体外评价

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摘要:

本文以水难溶性药物布地奈德为模型药物, 研究超临界流体技术制备布地奈德-聚氧乙烯固体分散体的方法及其影响因素。采用超临界二氧化碳静态法制备布地奈德-聚氧乙烯固体分散体, 用粉末X射线衍射法、差示扫描量热法、溶解度法和体外溶出实验进行固体分散体的物相鉴别。在40℃, 20 MPa条件下, 布地奈德-聚氧乙烯N750(1:10)是形成固体分散体的最佳条件, 布地奈德与聚氧乙烯载体形成氢键, 以无定形状态存在于载体中, 溶解度和体外溶出速率显著提高。超临界流体技术是制备固体分散体的一种可行方法。

关键词: 超临界流体 固体分散体 布地奈德 聚氧乙烯

Preparation of budesonide-poly (ethylene oxide) solid dispersions using supercritical carbon dioxide and *in vitro* evaluation

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Abstract:

An application of supercritical fluids technology for processing of budesonide-poly (ethylene oxide) solid dispersions was presented. The correlations of the operation parameters in the preparation process were studied. Solid dispersions of budesonide in poly (ethylene oxide) were prepared using a static method for supercritical carbon dioxide and characterized by powder X-ray diffractometry, differential scanning calorimetry, intrinsic dissolution, and *in vitro* dissolution. It was found that the optimum condition of solid dispersions formation was as follows: temperature, 40℃; pressure, 20 MPa; the ratio of budesonide and poly (ethylene oxide), 1:10. Drug existed in amorphous state in hydrophilic poly (ethylene oxide) carriers and intrinsic solubility and dissolution rates were significantly enhanced. The mechanism of the enhanced dissolution may be attributed to the amorphous character of the budesonide, improvement of the wettability of the hydrophobic budesonide, together with the formation of hydrogen bond of budesonide and hydrophilic poly (ethylene oxide). The supercritical fluids process can be used as an alternative method for preparation of solid dispersions.

Keywords: solid dispersion budesonide poly (ethylene oxide) supercritical fluid

收稿日期 2006-04-19 修回日期 网络版发布日期

DOI:

基金项目:

通讯作者: 潘卫三

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