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Research Paper

Formulation and Process Optimization of Solid Dispersion of Meloxicam and PEG8000 Prepared by Spray Drying

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ABSTRACT: The poor solubility and wettability of meloxicam leads to poor dissolution and hence shows poor bioavailability. The present study is aimed at increasing solubility of drug using solid dispersion technique. The solid binary systems were prepared using different drug: polymer ratio (1:1, 1:5 and 1:10) with polyethylene glycol 8000 by different techniques like physical mixing, melting method and spray drying method. The formulations were characterized by differential scanning colorimetry, scanning electron microscopy and *in vitro* dissolution rate studies. The solubility of drug increased linearly with the increase in polymer concentration. The solid dispersion of drug prepared by spray drying method demonstrated higher drug dissolution rates in comparison to solid dispersion prepared by physical mixtures, melting method and pure meloxicam. Moreover, spray drying process parameters inlet air temperature and feed rate were also optimized to obtain maximum powder yield and satisfactory particle size and compressibility. The outcome indicated that with the increase in feed rate, the powder yield and Carr's index decreases but particle size increases. On the other hand, as the inlet temperature increases, powder yield and Carr's index increases.

KEYWORDS: Solid dispersions; Spray drying; Solubility; Meloxicam; Crystallinity