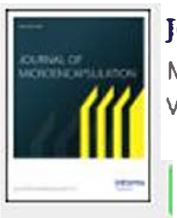

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Research Article

The use of response surface methodology in the evaluation of captopril microparticles manufactured using an oil in oil solvent evaporation technique

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Abstract

Captopril (CPT) microparticles were manufactured by solvent evaporation using acetone (dispersion phase) and liquid paraffin (manufacturing phase) with Eudragit® and Methocel® as coat materials. Design of experiments and response surface methodology (RSM) approaches were used to optimize the process. The microparticles were characterized based on the percent of drug released and yield, microcapsule size, entrapment efficiency and Hausner ratio. Differential scanning calorimetry (DSC), Infrared (IR) spectroscopy, scanning electron microscopy (SEM) and *in vitro* dissolution studies were conducted. The microcapsules were spherical, free-flowing and IR and DSC thermograms revealed that CPT was stable. The percent drug released was investigated with respect to Eudragit® RS and Methocel® K100M, Methocel® K15M concentrations and homogenizing speed. The optimal conditions for microencapsulation were 1.12 g Eudragit® RS, 0.67 g Methocel® K100M and 0.39 g Methocel® K15M at a homogenizing speed of 1643 rpm and 89% CPT was released. The value of RSM-mediated microencapsulation of CPT was elucidated.

response surface methodology microencapsulation solvent evaporation technique factorial design captopril