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Solid Dispersions of Cefixime Using β-Cyclodextrin: Characterization and in vitro Evaluation

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Abstract : Cefixime, a BCS class II drug, is insoluble in water but freely soluble in acetone and in alcohol. The aqueous solubility of cefixime in water is poor and exhibits exceptionally slow and intrinsic dissolution rate. In the present study, cefixime and β-Cyclodextrin (β-CD) solid dispersions were prepared with a view to study the effect and influence of β-CD on the solubility and dissolution rate of this poorly aqueous soluble drug. Phase solubility profile revealed that the solubility of cefixime was increased in the presence of β-CD and was classified as A_L-type. Effect of variable, such as drug:carrier ratio, was studied. Physical characterization of the solid dispersion was characterized by Fourier transform infrared spectroscopy (FT-IR) and Differential scanning calorimetry (DSC). These studies revealed that a distinct loss of drug crystallinity in the solid molecular dispersions is ostensibly accounting for enhancement of dissolution rate in distilled water. The drug release from the prepared solid dispersion exhibited a first order kinetics. Solid dispersions of cefixime showed a 6.77 times fold increase in dissolution rate over the pure drug.

Keywords : β-cyclodextrin, cefixime, dissolution, Kneading method, solid dispersions, release kinetics
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