

Thesis Title	Development of Dextromethorphan Sustained Release Suspension Prepared by Ion Exchange Method
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ABSTRACT

Dextromethorphan hydrobromide is a nonnarcotic antitussive agent with a short half life and requires frequent administration. Therefore, preparation as sustained release suspension could improve its therapeutic efficacy and convenience, especially to children and geriatric patients. Dextromethorphan sustained release in liquid dosage form could be prepared by using ion exchange resin as drug carrier. Dowex[®]50W, strong cation exchange resin, with 2, 4 and 8% degrees of cross-linking were used to prepare dextromethorphan resinates containing various drug loads. The release of dextromethorphan from drug resinates were studied by using USP apparatus II and simulated intestinal fluid was used as dissolution medium. Dextromethorphan resinate which gave a suitable release profile was selected so as to develop sustained release suspension.

It was found that dextromethorphan released from all of dextromethorphan resinates was regulated by particle diffusion control. The release rate of dextromethorphan from drug resinate relied on degree of cross-

linking of the resin and drug load in the resin. The higher the degree of cross-linking, the slower the release of dextromethorphan. Besides, the percent dextromethorphan released from drug resinate increased when the drug load was increased. The dissolution data of various drug resinates were used to compute blood concentration of dextrophan (active metabolite of dextromethorphan) by using time slicing method and pharmacokinetic parameters of dextrophan. It was found that suitable blood concentration of dextrophan could be obtained from 4% cross-linking degree of drug resinate containing 46.01% drug load. Sustained release suspension of the drug-resinate was developed. The drug-resinate suspensions were prepared by varying concentrations of sodium carboxymethylcellulose (SCMC), xanthan gum and PEG 6000 in the core formula. Suspensions, using 1%w/v SCMC and 0.7%w/v xanthan gum as suspending agent, had optimum physical properties after 30 days of storage. However, after 90 days, suspension containing 1%w/v SCMC remained in good physical properties of the suspension and rheological property and viscosity of the preparation did not affect the release of dextromethorphan from suspension