

Int. J. Pharm., 262, 13-22 (2003)

The use of complexation with alkanolamines to facilitate skin permeation of mefenamic acid

Liang Fang (方 亮)^a, Sachihiko Numajiri (沼尻幸彦)^a, Daisuke Kobayashi (小林大介)^a, Yasunori Morimoto (森本雍憲)^{a,b}

^aFaculty of Pharmaceutical Sciences, Josai University, 1-1 Keyakidai, Sakado, Saitama 350-0295, Japan

^bResearch Institute of TTS Technology, 1-1 Keyakidai, Sakado, Saitama 350-0295, Japan

The preparation of mefenamic acid (MH)-alkanolamine [monoethanolamine, diethanolamine, triethanolamine and propanolamine] complexes was attempted to increase the transdermal flux of MH. A lipophilic enhancer system consisting of isopropyl myristate (IPM) and ethanol (9:1; EI system) produced a marked enhancement of MH flux from the alkanolamine complexes through hairless rat skin membrane. Among the alkanolamines examined, the propanolamine complex had the greatest enhancing effect on the permeation of MH. The observed permeation enhancement of MH-alkanolamine complexes by the EI system was explained by an analysis based on a two-layer diffusion model. The stratum corneum immersed in IPM forms a continuous phase of vehicle and stratum corneum and, from the phase, ethanol transport the MH-alkanolamine complexes to the epidermis and dermis, and the complexes, which are more water soluble than MH, exhibit increased partition into the epidermis and dermis, as flux increases.