Abstract

Charles University, Faculty of Pharmacy in Hradec Králové

Department of Pharmaceutical Technology

Supervisor: Dr. Georgios Paraskevopoulos, Ph.D.

Author: Denisa Trávníčková

Title of the thesis: Effect of selected imidazolium ionic liquids on the permeability of human skin during their co-application with model compounds

Transdermal application is due to the ease of application, avoiding the first-pass effect and the large surface area of the skin make it a suitable route of administration. The stratum corneum is the main barrier that limits the access of most substances to the deeper layers of the skin and to the systemic circulation. In addition, the permeation of drugs through the skin is influenced by a number of factors, particularly the physicochemical properties of the substance. The structure and function of the SC is critical to the maintenance of the skin barrier, and finding a way to overcome the barrier properties of the skin that does not damage the skin is difficult. The use of ionic liquids as skin penetration enhancers represents a new direction in the development of dermatological and pharmaceutical products. The structure of ionic liquids allows for a myriad of combinations of cations and anions that could theoretically lead to the synthesis of ionic liquids with desired properties or applications.

This work contributes to the understanding of the influence of two imidazolium ionic liquids on the permeation profile of the model compounds- theophylline and diclofenac sodium, when applied to human skin using Franz diffusion cells. The findings of this study show that the co-application of 1-methyl-3-octylimidazolium bromide and 3-dodecyl-1-methylimidazolium bromide in the form of a 20 mM aqueous suspension with theophylline and diclofenac sodium resulted in an effect on skin penetration and retention of the drug in the skin.