

Abstract

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Title of the thesis: Effect of 1-methyl-3-octylimidazolium bromide to the permeability of human skin when applied in different media

In this thesis, the effect of ionic liquids (IL) on the permeability of human skin was investigated. IL represent a potential group of substances that can facilitate the transfer of drugs through the skin. The amphiphilic IL 1-methyl-3-octylimidazolium bromide (C_8MIM) was used in the experiment. Theophylline (TH), a hydrophilic molecule, and diclofenac sodium (DIC), a more lipophilic and larger molecule, were used as model compounds. Three different media were chosen for the application of the model substances (water (H_2O), 60% propylene glycol (PG) in H_2O and Ethanol (EtOH) 96%). The prepared samples were used for permeation experiments on human skin.

The results showed increased penetration of TH through human skin in the presence of C_8MIM when applied in H_2O and EtOH 96%, but not by 60% PG in H_2O . Skin retention of TH was significant using EtOH 96% (with high variability between samples) and results were not statistically significant for the other solvents. Skin penetration did not increase in any of the samples with DIC and C_8MIM (when applied in H_2O , the amount of DIC in the acceptor was even reduced compared to the sample without C_8MIM). The retention of DIC in the skin was increased with the use of H_2O , the trend was also evident with EtOH 96%. The obtained data showed that the permeation results are depended not only on the used medium but also on the properties of the permeant.