

# Abstract

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Title of the thesis: Incorporation of selected imidazolium ionic liquids in model lipid membranes and their permeability effect

One of the main difficulties of transdermal drug administration is to overcome the almost impermeable skin barrier, which is located in the *stratum corneum* (SC). However, there are compounds that allow, or they make it easier to overcome this barrier, the so-called (trans)dermal penetration enhancers. These compounds also include ionic liquids (IL). IL are salts whose melting point is below 100 °C and under normal conditions they are in a liquid state. They have a large range of variable characters and can be combined in countless ways to achieve desired properties. They have been shown to have the ability to facilitate passage through the skin barrier.

In this experiment, two IL, 1-octyl-3-methylimidazolium bromide (C<sub>8</sub>MIM) and 1 dodecyl-3-methylimidazolium bromide (C<sub>12</sub>MIM) were investigated as skin permeation enhancers. Instead of human skin, model lipid membranes were used to better understand the effect of IL compared to complex and diverse biological tissue. Permeation experiments were performed using theophylline (TH) and diclofenac sodium (DIC) as model molecules.

The experiment demonstrated several times higher permeability of the skin barrier when using IL. In the comparison of C<sub>8</sub>MIM and C<sub>12</sub>MIM, C<sub>8</sub>MIM proved to be a better accelerant of transdermal penetration.