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Original Paper

Effect of Emulsifiers and Their Liquid Crystalline Structures in Emulsions on Dermal and Transdermal Delivery of Hydroquinone, Salicylic Acid and Octadecenedioic Acid

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Dermal delivery
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Abstract

This study investigated the effect of emulsifiers and their liquid crystalline structures on the dermal and transdermal delivery of hydroquinone (HQ), salicylic acid (SA) and octadecenedioic acid (DIOIC). Emulsions containing liquid crystalline phases were compared with an emulsion without liquid crystals. Skin permeation experiments were performed using Franz-type diffusion cells and human abdominal skin dermatomed to a thickness of 400 µm. The results indicate that emulsifiers arranging in liquid crystalline structures in the water phase of the emulsion enhanced the skin penetration of the active ingredients with the exception of SA. SA showed a different pattern of percutaneous absorption, and no difference in dermal and transdermal delivery was observed between the emulsions with and without liquid crystalline phases. The increase in skin penetration of HQ and DIOIC could be attributed to an increased partitioning of the actives into the skin. It was hypothesized that the interaction between the different emulsifiers and active ingredients in the formulations varied and, therefore, the solubilization capacities of the various emulsifiers and their association structures.

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