

Production and Characterization of Semi-Solid Formulations for the Delivery of the Cosmetic Peptide Palmitoyl-GHK

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Streszczenie

In this study, vesicular lipid systems and semi-solid formulations for the skin application of Palmitoyl-GHK were formulated and characterized. Palmitoyl-GHK is a cosmetic peptide with anti-aging action, capable of treating the signs of skin aging by mainly stimulating collagen synthesis in the dermis. The so-called “ethosomes” were evaluated as nanovesicular systems constituted of phosphatidylcholine, organized in vesicles, ethanol, and water. In addition, semi-solid systems were produced and characterized, namely an organogel based on phosphatidylcholine, isopropyl palmitate, and water, a gel based on Poloxamer 407, and the poloxamer organogel, created by combining organogel and Poloxamer gel. To make the ethosomal dispersions suitable for skin application, xanthan gum was added as a gelling agent. Studies were therefore carried out on semi-solid formulations to determine (i) the spreadability, a key factor that influences various aspects of a topical/transdermal formulation, (ii) the occlusive factor, important to guarantee good effectiveness of a dermocosmetic product, and finally, (iii) the hydrating power, to study the effect of a formulation applied to the skin. A formulation study enabled the selection of the most suitable formulations for the incorporation of the active ingredient of interest. Palmitoyl-GHK was found to be soluble both in ethosomes and in the poloxamer organogel. In vitro studies were therefore conducted to evaluate the release kinetics of Palmitoyl-GHK from the formulations, via Franz cells. The qualitative–quantitative analysis, through analytical HPLC, highlighted that the active ingredient is released more slowly from semi-solid formulations compared to vesicular systems; in particular, the presence of poloxamer allows a controlled release of the peptide. Further studies will be necessary to verify the anti-aging efficacy of formulations containing the peptide.

Słowa kluczowe

peptide, anti-aging effect, ethosome gel, phosphatidylcholine, poloxamer organogel

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