

DEVELOPMENT OF A HIGHLY PERSISTENT SILICONE-BASED SPRAYABLE EMULSION CONTAINING ESSENTIAL OILS FOR TREATMENT OF SKIN INFECTIONS

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Abstract

Essential oils have known a renewed interest, particularly for their antimicrobial properties. In the field of skin delivery of essential oils, fluid oil-in-water (O/W) emulsions have been studied for several years in order to improve their stability. When dealing with infections of the upper skin layers, these vehicles, in spite of their low viscosity, must have a good skin persistence and also concentrate the essential oil components in the target skin layers. Given the well-known ability of alkylsiloxysilicate resins to induce a very substantive and non-occlusive film after cutaneous application in an appropriate preparation, it has been undertaken to use them to prepare a highly persistent O/W fluid emulsion of essential oil. Hence, after the successful development of a fluid silicone-in-water (Si/W) emulsion integrating a 100% trimethylsiloxysilicate resin, the essential oil was incorporated in this emulsion. The physical and chemical stabilities of the prepared emulsion were then studied in the final packaging under different storage conditions. In addition, the skin penetration profile of essential oil from this vehicle was investigated, *ex vivo*, on pig ear skin, using Franz diffusion cells and analytical techniques such as confocal Raman microscopy. As the developed vehicle was found to meet our delivery expectations, its skin tolerance has been proven by an *in vivo* chromametric evaluation of its irritant potential. The skin persistence of this emulsion containing an antimicrobial essential oil was then studied. Considering its properties, the developed emulsion is expected to represent a real asset in the treatment of skin infections, particularly infections of upper layers of human skin such as dermatophytosis.

Keywords: Essential oils; confocal Raman microscopy; emulsions; silicone film-forming resins; sprays.

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