日本香粧品学会誌　Vol. 31, No. 1, pp. 1–7 (2007)

〈一般論文〉

メトキシケイヒ酸2-エチルヘキシルの皮膚移行に与える2-Methacryloyloxyethylphosphorylcholine Butylmethacrylate共重合体の影響

藤井まき子*，和久井　京*，花田真隆*，大谷寿子*，
石川亜紀子*，近藤昌夫*，渡辺善照*

Effect of 2-Methacryloyloxyethylphosphorylcholine Butylmethacrylate Copolymer on the Skin Penetration of 2-Ethylhexyl Methoxycinnamate

Makiko FUJII,* Miyako WAKUI,* Masataka HANADA,* Hisako OTANI,*
Akiko ISHIKAWA,* Masuo KONDOH,* Yoshiteru WATANABE*

(Accepted: January 22, 2007)

Abstract

We studied a formulation which inhibits skin penetration of 2-ethylhexyl methoxycinnamate (MCO). Emulsions (o/w) containing 5%MCO and 5% soybean oil (SO) were prepared using 2-methacryloyloxyethyl phosphorylcholine butylmethacrylate copolymer (PMB), egg phosphatidylcholine (PC) or polysorbate 80 (TO) as an emulsifier. The use of a high-pressure emulsifier resulted in a mean oil droplet size of 200–500 nm, which did not change over at least one month. Skin penetration of MCO was determined by testing with Yucatan micropig skin *in vitro*. When emulsions were applied under infinite conditions (2 ml/cm^2, closed), there was no difference among the formulations. Under finite conditions (2 μl/cm^2, open), about 90% of the MCO was retained in the stratum corneum when the emulsion made with 4%PMB was used; this proportion was significantly higher than those obtained with other emulsions. The emulsions made with PC and TO changed phase from o/w to w/o in drying process; however, the emulsion made with PMB showed no phase change and was dried with maintenance of the oil phase (MCO＋SO) in PMB. An *in vivo* study with rabbits also showed high retention in the stratum corneum when a 4%PMB emulsion was used. Thus, polymer surfactant PMB is useful for achieving retention of MCO on the surface of the skin and preventing penetration into the viable epidermis.

Key words: 2-ethylhexyl methoxycinnamate, skin penetration, 2-methacryloyloxyethylphosphorylcholine butylmethacrylate copolymer, emulsion.