

〈原 著〉

## 非イオン性界面活性剤による メチルパラベンのモルモットの皮膚透過への影響

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### Effect of Nonionic Surfactants on Guinea-pig Skin Permeation of Methylparaben

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#### Abstract

The effect of 14 nonionic surfactants on excised guinea-pig skin by using of methylparaben (MP) as a permeated product was studied in Franz diffusion cell. After the treatment of 0.5% surfactant solution, the MP concentrations permeated were analyzed by HPLC. The addition of 10-30% ethanol gave the slight increase of the steady-state flux of MP. The effect of sodium dodecyl sulfate as a positive control on skin decreased around half caused by the addition of 10-30% ethanol. There was a linear relationship between steady-state flux of MP and 0.25-1.0% polyoxyethylene nonyl phenyl ether (POE.NPE) concentrations, and the barriers's function of stratum corneum suffered straight from the increase of concentrations of POE.NPE. Coconut oil fatty acid diethanolamide, polyoxyethylene (20) sorbitan monopalmitate, polyoxyethylene (10) oleyl ether, and polyoxyethylene (21) lauryl ether especially enhanced the steady-state flux of MP which were the approximately same as that obtained from sodium dodecyl sulfate. The effect of surfactants on skin depended on their carbon numbers of aliphatic hydrocarbon which were 12 in the case of polyoxyethylene's series and 16 in the case of polyoxyethylene-sorbitan's series. The correlations between the steady-state flux of MP and Draize score 20<sup>5)</sup> or hydrophile-lipophile balance gave the agreement ( $p < 0.05$  or  $p < 0.1$ ).

**Key words:** nonionic surfactant, excised skin, methylparaben, permeation, HPLC.