

Studies on application of antioxidative emulsifier as functional cosmetics

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Octanoyl, lauroyl and palmitoyl ascorbates as antioxidative emulsifier were synthesized by the condensation of ascorbic and the corresponding fatty acids in acetone using an immobilized lipase from *Candida antarctica*. The oxidation process of methyl linoleate as an oil droplet in the O/W emulsion with ascorbic acid or acyl ascorbate was measured at 40°C, and their antioxidative properties against the oxidation were examined. Hydrophilic prooxidant, AAPH, or lipophilic prooxidant, AMVN, was added to the water or oil phase to investigate the properties, and the kinetic parameters for the oxidation expressed by the Weibull equation were evaluated.

It was suggested that most of the ascorbic acid molecules in the emulsion would be present in the water phase due to its high hydrophilicity and suppress the AAPH-induced oxidation on the interface between the water and oil phases. Lauroyl and palmitoyl ascorbates would be dissolved in the oil phase and contribute to the suppression of the oxidation in the oil phase rather than on the interface. Octanoyl ascorbate, whose hydrophilic-lipophilic balance number is 11.8, would be in both phases. Regardless of the presence and type of the ascorbate, the rate constant, k , of the Weibull equation decreased as the pH of the water phase increased.