

Evaporation of a model skin lotion with beta-hydroxy acids.

[Al Bawab A](#), [Friberg SE](#), [Fusco C](#).

Department of Chemistry, University of Jordan, Amman, Jordan. abeerbawab@yahoo.com

Abstract

Two beta-hydroxy acids, malic and salicylic acids were combined with a non-ionic surfactant, a commercial pentaerythritol sorbitan mono-oleate and water to form a simple model of a skin lotion and the phase diagrams were determined. One emulsion formulation with relative amounts of the three components similar to those in commercial lotions was used to observe microscopically the changes in the emulsion structure during evaporation. The microscope images were subsequently compared to the information from the phase diagram under equilibrium conditions. The results showed the behavior of the systems of the two acids to be distinctly different; as exemplified by that of a typical formulation with 3% by weight of acid and 5% of surfactant. The malic acid system consisted of vesicles, exclusively formed by the surfactant and water, in an aqueous molecular solution of the acid and the initial evaporation resulted in an increase of the acid concentration in the aqueous solution to reach 35.5%, before solid crystals of the acid solid solution appeared. The salicylic acid formulation, on the other hand, already at the beginning of the determination consisted of water, particles of the acid solid solution and surfactant vesicles. In both cases the remaining deposit after total evaporation was particles of a solid acid solution and liquid surfactant.