

FORMULATION OF ENVIRONMENTALLY FRIENDLY COSMETIC CREAMS

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A cosmetic cream in semi-solid state is used as a barrier, moisturiser and carrier to protect, hydrate and deliver active ingredients to skin. These are generally formulated with water, oil and surfactant. 10-20 w/w% surfactants are normally involved in the formula, in order to emulsify and stabilize the thermodynamically metastable state. With the enhancement of public awareness of environmental pollution, considerable attention has been given to biological derived surface-active compounds instead of their counterparts of petroleum origin, due to their excellent surface activity and environmentally friendly properties.

Flow properties such as texture, consistency, greasiness, and stability of cosmetic creams directly determine the quality of products and the expectation of consumers to them. Rheological measurements are very useful in the development of consumer-satisfied products and optimisation of manufacturing process, where the flow and deformation behaviours of products can be revealed and predicted.

This project studies the effect of hand cream formulation with and without a biosurfactant on the product rheology. The base system contains cetyl alcohol (CA), glycerol monostearate (GM), and Sodium lauryl ether sulfate (SLES) with paraffin in water. Instead of the chemically synthesized surfactants, the cream was reformulated with Sophorolipid and Mannosylerythritol (MELs). In addition, vegetable derived oils were applied in replacement of mixed paraffin oils in the formulation. The products were analysed under steady state shear, dynamic oscillatory, and creep tests. Experimental results determined optimum rheological cream-like properties in products containing 4%wt SLES, 6%wt CA and 2%wt GM, and revealed that the product became less viscous and easier to flow when SLES concentration was increased. This is in part due to the surfactant structure, but also the paraffin droplet size achieved, analysed using a Mastersizer 3000. The average droplet size of the system with 2%wt SLES doubled that with 6%wt. Bio cream was successfully prepared with similar rheological properties comparable to the base system.