

Mild Syndet Surfactant Cleansing & Cutaneous Microbiome Integrity — Engineering Review 2025

Por Cristiano Ricardo · Publicado em 17/12/2025

Technical dermocosmetic engineering lecture by Prof. Cristiano Ricardo on mild syndet surfactant cleansing & cutaneous microbiome integrity (Cleansing Technology & Interfacial Colloidal Systems), featuring colorful schematic diagrams and clinical data.

Versão online e eventuais atualizações:

<https://cristianoricardo.com/post/mild-syndet-surfactant-cleansing-cutaneous-microbiome-integrity-2025-12-17>

Cleansing Technology & Interfacial Colloidal Systems · Cosmetic Engineering & Science

Traditional soaps solubilize vital epidermal barrier lipids; engineered synthetic detergents (syndets) cleanse while preserving skin barrier homeostasis.

Engineering Mechanism & Kinetic Flowchart

Traditional Soap (pH 9.0-10.0)

? Solubilizes intercellular lipids

? Denatures stratum corneum keratin

Alkaline disruption of microbiome

Syndet Cleanser (pH 5.0-5.5)

? Sodium Cocoyl Isethionate (SCI)

? Large mixed micelles (No penetration)

Preserves *S. epidermidis* acid mantle

Critical Micelle Concentration (CMC) Optimization

Monomeric surfactant molecules cause irritation by inserting into cellular membranes.

Combining anionic sodium cocoyl isethionate with amphoteric cocamidopropyl betaine and non-ionic alkyl polyglucosides lowers the CMC, promoting the assembly of large, non-penetrating mixed micelles.

Acid Mantle Homeostasis

Formulating cleansers strictly at pH 5.0–5.5 maintains activity of epidermal lipid processing enzymes (beta-glucocerebrosidase and acid sphingomyelinase), preventing alkaline swelling of corneocyte desmosomes.

Microbiome Preservation

A physiologically buffered wash preserves resident commensals (*Staphylococcus epidermidis*), which secrete antimicrobial peptides (AMPs like lugdunin) to prevent dysbiotic overgrowth of pathogenic *Staphylococcus aureus*.

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