Sustainable Green Emollients: Plant Alkanes Replacing Volatile Silicones (Engineering Review 2020)

Por Cristiano Ricardo · Publicado em 02/01/2020

Technical dermocosmetic engineering lecture by Prof. Cristiano Ricardo on sustainable green emollients: plant alkanes replacing volatile silicones (Green Chemistry & Cosmetic Raw Material R&D), featuring colorful schematic diagrams and clinical data.

Versão online e eventuais atualizações:
https://cristianoricardo.com/post/sustainable-green-emollients-plant-alkanes-replacing-volatile-silicones-2020-01-02

Green Chemistry & Cosmetic Raw Material R&D · Cosmetic Engineering & Science

Transitioning from petroleum-derived volatile cyclosiloxanes (D5, D6) to circular, bio-based hydrocarbons.

Engineering Mechanism & Kinetic Flowchart

Cyclopentasiloxane (D5)
? Synthetic Organosilicon
? Environmental Bioaccumulation (vPvB)
Global Regulatory Restrictions

C13-15 Alkane (Hemisqualane)
? 100% Fermented Sugarcane
? Readily Biodegradable (OECD 301)
Identical Dry Sensorial Slip & Spread

Fermentation-Derived Hemisqualane (C13-15 Alkane)

Engineered through the yeast fermentation of renewable sugarcane, this branched isoalkane replicates the low surface tension, volatility, and feather-light dry slip of D5 silicone without aquatic toxicity.

Spreading Cascade Optimization

Blending fast-spreading polar esters with slow-spreading vegetable triglycerides establishes a continuous sensory cascade: instant spreadability on initial rub-out transitioning to long-lasting barrier comfort.

OECD 301 Ready Biodegradability

Modern sustainable inputs must achieve > 60% mineralization into CO2 and water within a 10-day window under OECD 301 guidelines, preventing persistent micro-pollutants in wastewater.

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