SCC78

DECEMBER 11-13, 2024 | LOS ANGELES, CALIFORNIA

Speaker Abstracts

Session D: Hair & Scalp Health

SCC 78TH ANNUAL SCIENTIFIC MEETING & SHOWCASE
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Optimized Mildness with Polymeric Surfactants

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ABSTRACT

Globally, consumers with sensitive skin seek cleansing solutions that are less irritating, more natural, and more sustainable. Historically, formulators have approached sensitive skin by formulating solutions with milder surfactants that are typically more costly. This study examines the ability of a naturally-derived and readily biodegradable polymeric surfactant to increase the micelle size of conventional surfactants in order to yield a system with lower skin irritation potential. The objective of this study was to demonstrate how an increase in micelle size using a polymeric surfactant could yield a reduction in irritation potential. Additional tests were conducted to ensure that foam characteristics critical to the consumer experience, namely foam build and foam decay, were not negatively impacted. The effect on viscosity build in surfactant systems that use salt as a viscosity builder was also studied as a critical parameter for formulators. The addition of polymeric surfactant was optimized to yield the lowest statistically significant increase in micelle size, as measured with a Malvern Zetasizer Nano. Formulations with significant increases were then analyzed for Zein solubilization potential against systems without the polymeric surfactant. Changes in foam build and foam decay were analyzed using a SITA Foam Tester instrument. Viscosity build was also evaluated with a Brookfield viscometer. Three surfactant systems were evaluated in this study at both 8% and 15% actives. In each system, the polymeric surfactant proportionally displaced the primary and secondary surfactants at values between 0.5% and 5%. Results indicated that increases in micelle size measured between 4.38% and 31.5% while irritation potential was reduced anywhere from 10% to 19%, depending on the surfactant formulation and level of polymeric surfactant incorporated. In all systems, replacing the traditional surfactants with a polymeric surfactant did not negatively affect the foam characteristics. The use of the polymeric surfactant combined with common surfactants including SLES, SMCT, AOS, and CAPB will be further discussed in this paper. A statistically significant increase in micelle size can be achieved by proportionally displacing surfactant with a polymeric surfactant which correlates with a statistically significant reduction in irritation potential as measured by Zein solubility. Furthermore, the use of the polymeric surfactant does not compromise foam characteristics and does not significantly alter viscosity build in systems that use salt as a thickener. With increasing consumer demand for mildness in personal care cleansing systems, the results of our study demonstrate that lower irritation potential can be achieved with minimal modification to the surfactant chassis. At optimized displacement levels within the surfactant system, a polymeric surfactant can also be a cost-effective solution that doesn't impact the consumer expectation for foam. Both aspects thus provide greater flexibility for the formulator and more options for the consumer.

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Improve Sensitive Scalp of Textured Hair People with Artificial Intelligence

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ABSTRACT

Sensitive scalp is a global growing concern, also affecting women with textured hair. Those women have hairs and scalp prone to dryness with scalp sensitivity symptoms. Due to limited research on textured scalp hair concerns, we aimed to find a suitable scalp care product for concerned people.

Combining predictions of machine learning with in-vitro tests, we evaluate trillions of peptides. After several data entries, a predicted architecture was built via deep learning models to identify and unlock anti-inflammatory peptides from rice protein.

In-vitro assays showed that the peptides inhibit TNF-α release from macrophages. Under TNF stress, the unlocked peptide solution increased filaggrin in reconstructed epidermis.

In vivo, it significantly reduces symptoms linked to sensitive scalp (redness) vs placebo and significantly improves scalp hydration (vs D0).

This study allows to discover a new generation of natural plant-based peptides that fulfill the consumer needs of multi-ethnic beauty products with scientifically proven claims.

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Understanding the Effects of Imbalance in Common Scalp Disorders

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ABSTRACT

As a new, trendy category, it is important to understand consumers' attitudes and expectations regarding scalp care. By doing so, we discovered that scalp care is becoming a wellness focus with 93% of consumers already taking care of their scalp as an essential part of their beauty routine. Scalp health is above all a question of comfort, well-being and self-confidence. Apart from understanding the need for solutions, it is equally imperative to investigate the origin of the irritation.

This presentation is a deep dive into the understanding of scalp specificities and the imbalance at the origin of scalp disorders. Looking closely at the bacteriome as well as the mycobiome, we take an in depth look at how the imbalance of the scalp microbiome affects the overall health of the scalp, the role that sebum plays in scalp discomfort and common scalp disorders such as dandruff, seborrheic eczema , atopic scalp and general irritation.

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Unveiling Ultrafine Structure of Hair Surface by Quantitative Nanomechanical Property Mapping

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ABSTRACT

This study utilized Atomic Force Microscopy (AFM) in conjunction with PeakForce Quantitative NanoMechanics (QNM) mapping to investigate the nanoscale mechanical properties of the hair surface. High resolution images of modulus, adhesion, and energy dissipation were captured, enabling an examination of the ultrafine structures across different zones of the hair cuticle. A unique nano-domain structures were discovered based on nanomechanical properties: soft hydrophobic domains with low modulus are interconnected by more rigid hydrophilic boundaries with high modulus. Furthermore, a comparative analysis of virgin, bleached, and UV-irradiated hair samples revealed various forms of nanoscale damage in cuticle regions. These findings significantly advance the understanding of the ultrafine structural integrity of hair surfaces, particularly in relation to the effects of environmental and chemical treatments at the nanoscale.