SCC78

DECEMBER 11-13, 2024 | LOS ANGELES, CALIFORNIA

Speaker Abstracts

Session J: Advancing Photoprotection

SCC 78TH ANNUAL SCIENTIFIC MEETING & SHOWCASE
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Increased Temperature Related to Climate Change Impacts the Penetration of Sunscreen into our Skin

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ABSTRACT

Sunscreen use is crucial in preventing skin damage and diseases caused by UV exposure. As temperatures rise due to global warming, hotter temperatures alter the configuration of lipids inside the stratum corneum and increase UV filter skin penetration, posing potential health risks. This work investigates and compares the penetration of encapsulated and non-encapsulated organic UV filters from sunscreen formulations into ex-vivo human skin at different external temperatures by vibrational imaging spectroscopy and HPLC methodologies. The results show a clear correlation between the external temperature and the penetration of organic UV filters, where 42°C increased the penetration of organic UV filters into the skin, while physiological conditions (32°C) and lower temperature (20°C) restricted it. Also, significant differences in behaviors between encapsulated and non-encapsulated formats were recorded. Based on our findings, we recommend evaluating sunscreen formulations at higher temperatures than the current standard of 32°C to develop safer and more effective products.

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A Multi-factor Study on the Benefits of Adaptive Photoprotection

Judit Camargo

Roka Furadada

ABSTRACT

ROKASmartUV®PvB360 is the first photo-adaptive active ingredient of the market. It is a photochemical precursor that, when exposed to UVB radiation become a UVA absorber through a photofries reaction. As a result, it increases the UVA protection of cosmetic formulations over time. This active is a battery of UVA protections that prevents UVA-induced skin pigmentation and skin photoageing. Prevention against sun-induced skin pigmentation was demonstrated in 20 volunteers (phototype III-IV) in an hemiface application study under real summer sun exposure conditions measuring the ITA°. Application of a SPF30 sunscreen containing 2% of ROKA Smart UV® PvB 360 resulted in prevention of tanning significantly after 21 days. Skin photoageing prevention was evaluated in vitro on three different markers triggered by UVA radiation (ROS, mitochondrial DNA damage and Active MMP1/collagenase). The assessment of UVA-PF and its increase was done in vitro on PMMA plates after irradiating the samples in a sun simulator.

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Redispersable Biofabricated Cellulose Powder in Sun Care: High Performing SPF Booster at Low Dosage

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ABSTRACT

Harnessing the power of biotechnology, biofabricated cellulose is a biopolymer produced by bacteria, featuring a unique 3D network of incredibly thin, crystalline cellulose fibrils interwoven in water. This structure effectively stabilizes active ingredients and forms a protective barrier on the skin against UV radiation. These characteristics position biofabricated cellulose as a powerful SPF booster, enhancing the efficacy of UV filters in sunscreens. Unlike traditional synthetic or natural SPF boosters added as particles, our biofabricated cellulose is incorporated in a novel redispersible powder form that transforms into suspension, utilizing its 3D fiber network within the formula. We assessed the SPF-boosting efficacy using in-vitro and in-vivo methods, while also evaluating viscosity and yield stress to understand how biofabricated-cellulose enhances SPF. Our study demonstrates that redispersible biofabricated cellulose significantly boosts SPF even at low concentrations (<0.5% wt.), offering a breakthrough as a high-performing, next-generation bio-based, and sustainable SPF booster.

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Democratizing Dispersion: Improved Biobased Dispersing Systems for Zinc Oxide

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ABSTRACT

Demand for “natural” mineral sunscreens based on uncoated Zinc Oxide (ZnO) continues to increase; however, dispersing uncoated ZnO powder is technically challenging and often forces formulators to opt for costly premade ZnO dispersions which limit flexibility in formula design. We have developed new dispersing media based on combinations of biobased esters with specific grades of Polyhydroxystearic Acid (PHSA). Biobased esters, Heptyl Undecylenate, Diisooctyl Succinate, and Triheptanoin with PHSA were evaluated as dispersing media for uncoated, non- nano, and UV grade ZnO. Dispersions were evaluated for viscosity as functions of [PHSA] and [ZnO] then used to make W/O and O/W emulsions that were characterized by rheological analysis and UV transmittance. The unique combination of biobased esters and broad molecular weight distribution PHSA exhibited dramatically lower viscosities than dispersions based on Caprylic/Capric Triglyceride, enabling higher solids loadings of ZnO and more desirable rheological and sensory profiles for sunscreens.