Polimeric nanoencapsulation to improve efficacy and safety of cosmetic ingredients

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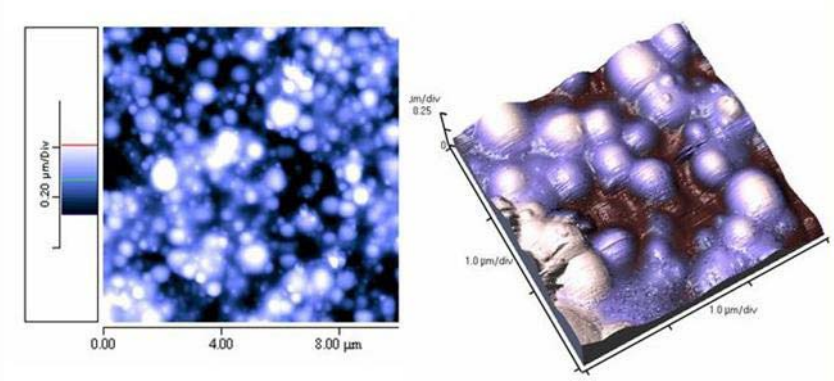
The product is a polymeric nanoparticulate delivery system able to realize the site specific targeting of the active and the protection of the ingredient encluded. The product is efficient as carrier for photounstable sunscreens by improving their stability and by maintaining the active at the skin surface that represents its target.



AFM image of poly(D,L-lactide) nanoparticles

1. Description of the product

The delivery system here proposed is based on polymeric nanoparticles made by poly(D,L-lactide) for cutaneous application of sunscreens. The long degradation time of the polymer allows the nanoparticles incorporation onto cosmetic formulations as emulsion, emulsion-gel or gel maintaining the stability of the carrier system. Moreover nanoparticles are sufficiently small to avoid irritative and abrasive effects during the application and sufficiently big to avoid the transdermal penetration of the incapsulated ingredient.

2. Innovative aspect of the product

The use of sunscreens is the "gold standard" for protecting the skin from ultraviolet light. However the more used organic UV filters (octyl metoxycinnamate, benzophenone-3) are capable of inducing photoallergic and allergic reactions or can be photoinactivated (octyl metoxycinnamate, avobenzone) after sunlight exposure. Moreover some sunscreen products, containing an association of UV filters to obtain very high solar protection factors, can present problems of chemical compatibility. The delivery system here presented was applied for the incorporation of the organic sunscreen octyl metoxycinnamate (OMC) allowing the increase of the photostability of the UV filter, the elimination of chemical incompatibility between ingredients and the reduction of the skin contact and of the penetration into the dermis.

3. Main advantages of the offer

The delivery system proposed allows the cutaneous application of sunscreens improving its safety and efficacy. Currently the carrier system has been applied to the sunscreen octyl metoxycinnamate (OMC); nanoparticles present good encapsulations efficiency (87.06 ± 3.96%) and are able to hold the sunscreen inside of them, reducing the contact between the Active and cutaneous cells and diminishing the risk of photosensitization.

The incorporation of OMC in nanoparticle systems is able to reduce the photoinactivation of 30.5%. Moreover the sun protection factor evaluation highlight that polymeric carrier does not reduce the protective power of the sunscreen.
Transdermal penetration studies show that the carrier is able to maintain the OMC on skin surface reducing meaningfully the penetration into the dermis.

4. Technology key words

Polymeric nanoparticles, sunscreens; photostability

5. Current Stage of Development

Development phase – laboratory tested

6. Intellectual Property Rights

Partnership/other contractual agreements

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