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Nanoparticles in Cosmetics – Advantages / Disadvantages

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Nanoparticles have been introduced as a novel drug delivery system for pharmaceutical drugs in various application routes but they also represent a promising carrier system for cosmetic active ingredients due to their numerous advantages over existing conventional formulations

(1) The protection of labile compounds against chemical degradation has been shown, e.g. for retinol and tocopherol, coenzyme Q10 and ascorbyl palmitate.

(2) Colloidal carriers can provide controlled release profiles for many substances, enhancing the percutaneous absorption, and they can show burst release characteristics as well as a sustained release.

(3) Due to the occlusive properties of many nanoparticles, an increased skin hydration effect can also be observed.

(4) SLN show a UV-blocking potential, i.e. they act as physical sunscreens on their own and can be combined with molecular sunscreens in order to achieve improved photoprotection.

Among the possible disavantages over the conventional formulations used in cosmetics, the costs of development and production of nanoparticles, including their stability in terms of physical stability and loading capacity (during storage, the expulsion of active ingredients can occur), and tolerability analysis (reached by using physiological and biodegradable constituents) should be considered and assessed.

Finally, according to the cosmetic legislation their penetration in the dermal stratum should be avoided, but these nanoparticles can increase their percutaneous release of actives from cosmetic formulations, highly relevant for their quality and safety assessment.