

〈シンポジウム〉

ナノテクノロジーの化粧品, 医薬品への応用: 化粧品分野への応用

ナノ原料—化粧品における安全性

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Safety Evaluation of the Nanoparticles on Cosmetics

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Abstract

With the advent and rapid development of nanotechnology, the safety of nanomaterials (NMs) is being evaluated around the world. Recently, the potential toxicity of NMs was picked up by the press, and cosmetic products containing NMs have received public concerns. Accordingly, the Japan Cosmetic Industry Association (JCIA) has conducted an original project on NMs, in order to reassure the consumers of their safety. The purpose of the project was to provide the consumers with comprehensive toxicological data on NMs. As a consequence of a questionnaire conducted on 741 member companies, 120 out of 478 companies (25.1%) answered that they used NMs. The same questionnaire and interview on raw material suppliers revealed that spherical titanium dioxide with particle size of less than 50 nm, was the most commonly used NM in the Japanese cosmetic industry, mainly formulated in sun care products and foundations.

Member companies have conducted extensive safety evaluation on NMs, presumably based on the toxicological data and usage of the larger conventional materials. Literature search has demonstrated that the majority of percutaneous absorption studies were conducted on titanium dioxide. The overall conclusion was that titanium dioxide did not penetrate stratum corneum and hence could not reach the epidermis and dermis. However, it was not clear as to how the NMs in the test sample were dispersed and how they were distributed on the skin. Hence there is no clear evidence that percutaneous permeability of NMs is accurately reflected. The particle size of NMs has been analyzed by microscopy, photon correlation spectroscopy methods, laser diffraction & dynamic light scattering methods and acoustic spectrometer methods. In order to characterize the dispersion of the NMs in the test sample and their status on skin, it was considered practical and realistic to make full use of the characteristics of each analytical method. The project found no direct evidence that exposure to NMs adversely affected human health. Therefore it was concluded that cosmetic products containing NMs were safe under present conditions of use. However, the safety assessment procedures of NMs are still under development. JCIA will continue to be on alert for the latest research trends in the field and, if necessary, will reevaluate its views, and update the consumers.

Key words: nanomaterial, cosmetic, JCIA, NEDO, safety.