

6th November, 2024

34th Congress IFSCC

- **Poster presentation**

**Characteristics of natural derived surface treated pigments
in various cosmetic formulations for the achievement of 'Clean beauty' (Maki
Kitanouma)**

Summary

Recently, 'clean beauty' has been getting a lot of attention in the cosmetic market. Therefore, we must develop the cosmetic formulation with natural and sustainable raw materials to achieve the demand of the consumers. In order to innovate a novel cosmetic formulation, it has been very important to select suitable surface treated pigments for each formulation. In this study, we evaluated the characteristics of various surface-treated pigments across different cosmetic formulations, including water-in-oil (W/O), oil-in-water (O/W), and oil-based formulations. This knowledge will be valuable for selecting appropriate surface treatments for each formulation and for developing new and unique cosmetic products.

**Analysis of molecular mobility of surface treatment agents on the surface of
cosmetic pigments using solid-state NMR spectroscopy (Reiichiro Tsuchiya)**

Summary

Since 2017, regulatory actions have been taken at European Union level to limit the use of synthetic polymer microparticles (SPM, Synthetic Polymer Microparticles). According to the amending Annex XVII to Regulation (EC) No 1907/2006 of the REACH, all cosmetic pigments involving solid polymers (either contained at more than 1 wt% or forming a continuous surface coating) will be considered to be microplastics. A derogation is possible for non-solid polymers. Therefore, we investigated the molecular mobility of surface treatment agents in the presence of the pigment using ¹H and ¹³C NMR spectroscopy. In particular, we investigated the relationships between the liquid

and solid states of these substances and their mobility. This study shows that even on the surface of pigment, solid-state NMR spectroscopy allows distinguishing liquid and solid states of molecules with different melting points, owing to the variable mobility of C–H bonds between these states. Conversely, these experiments indicate that the molecules without melting point, such as polydimethylsiloxane (PDMS) exhibit high mobility and remains in liquid-like state even at high viscosity that is defined as solid by regulations. Hence, pigment treated with PDMS would not be categorized as microplastics.