

# **Research and Development of Promising Skin-Gas Responsive Coloring Materials as Functional Cosmetics**

**Ryo Sasai**

*Graduate School of Natural Science and Technology, Shimane University*

In this research, I investigated the molecular detectable ability of the hybrid films of dyes with ion-exchangeable layered inorganic compounds. It was found that the protonation reaction of cationic porphyrin derivatives rapidly proceeded in the interlayer space of layered  $\alpha$ -zirconium phosphate modified with decylamine, even when the concentration of proton is relatively low. In the case of the hybrid film of anionic pyrene with layered double hydroxide (LDH), the photoluminescence intensity ratio of between monomer and excimer species of pyrene linearly depended on the toluene concentration in ethanol solution. I show for the first time that the LDH sheet film with fluorescein dyes and 1-butanedisulfonate could quantitatively detect ammonia in an aqueous solution by its photoluminescence intensity. These results are indicated that film materials which can detect specific molecules dissolved in solution can be prepared by hybridizing suitable dyes with ion-exchangeable layered inorganic compounds. Moreover, the present materials will be applicable for molecular detection of specific molecules in skin-gas and sweat.