

# Abstracts

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## Journal of the Society of Cosmetic Chemists Japan Vol. 44, No. 1, 2010\*

Basic Theory of Emulsification

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A significant problem in emulsion science concerns the selection of surfactants and the stability of emulsions. In the HLB system, emulsification needs to use an emulsifier depending on the properties of an oil. Emulsion preparations in cosmetics consist of a lot of oil ingredients. In order to prepare stable emulsions, it is necessary to select the optimal surfactant among tremendous numbers of surfactants as well as to understand the compatibility between material and material in a dispersed system. This paper reviews the HLB system, organic conception diagram and solubility parameter as a compatibility index, and the optimal selection of a surfactant by the HLB system. Furthermore, acceleration tests for emulsion stability in low and high temperature storages will be discussed in terms of the physical properties of the oil and emulsifier.

Development of 3D Powdery Cosmetics with New “Dry Binder”

Recently, various kinds of powdery cosmetics with multiple colors or unique surface patterns have been developed, but they are often difficult to mold. In this case we can use binders such as oil, wax and ultra fine particles in the molding process, but those binders sometimes cause the problem of “caking”. In this work, we studied petal-like calcium silicate (P-CS), which is one of the tablet molding binders in the pharmaceutical field, as a new dry binder for powdery cosmetics. We evaluated properties of P-CS by measuring the kinematic friction for the texture, Olzen hardness for the binding effect and the powder amount paid off for the usefulness as a cosmetic. From those results, it was found that size modified P-CS(10) had three unique properties as a binder for cosmetics : 1) P-CS (10) has a smooth and silky feeling when actually used for cosmetics, 2) the molded powdery cosmetics containing P-CS (10) resist causing caking and 3) the molded powdery cosmetics containing P-CS (10) have constant pay off across a wide range of hardness. Finally we developed an ultimate 3D powdery cosmetic that has a desirable texture and excellent usefulness without caking by using those properties.

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\* These abstracts appear as they were originally published. They have not been edited by the *Journal of Cosmetic Science*.

### The Effect of Rinse Water Obtained from the Washing of Rice (YU-SU-RU) as a Hair Treatment\*

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We researched the histories of the hairstyles and hair care practices of Japanese women, and found a very close relationship between the two. For example, the court ladies of the Heian Period, whose beautiful long hair, called suberakashi, reached to the floor, were said to have combed their hair each day using Yu-Su-Ru (rinse water obtained from the washing of rice). Rice is considered to be the most important food in the Japanese diet, and the historical fact that rice was used for hair care is very interesting. We therefore focused our attention on the Yu-Su-Ru hair care practice in the Heian Period, and examined its effects on hair. As a result, we found that Yu-Su-Ru exhibited hair care effects, such as reducing surface friction and increasing hair elasticity. However, when hair was treated with Yu-Su-Ru alone, flaking was observed on the hair surface, and the direct application of Yu-Su-Ru was considered difficult. Thus, Yu-Su-Ru extracts, which are highly effective in hair care and do not cause flaking were examined. The results showed that Yu-Su-Ru extracts had multiple functions for hair care at the same time. Thus, the new application of Yu-Su-Ru for hair care was discovered.

### Ultra Low Viscosity Emulsion with High Tolerance for Electrolytes\*

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Among many useful functions of modern skin-care products, moisturizing effect is the most fundamental and important. The "moisture-balance concept" which emphasizes the balance of lipid, Natural Moisturizing Factors (NMFs) and water is a key to improving skin

condition. Many skin-care products incorporating lipid and NMF have appeared on the market. However, since NMFs are electrolytes, their presence tends to cause lipid droplets to aggregate and seriously compromise the emulsion stability. Consequently, it has been practically impossible to incorporate both NMFs and lipids into ultra low viscosity products such as toning lotions, which limits their applications. We investigated certain biogenic materials capable of emulsifying lipid *in vivo* in the presence of electrolytes, including lecithins which have a high affinity for human skin. Our results showed that lysolecithin has high tolerance for electrolytes and high affinity for skin. We developed a novel emulsification technology using lysolecithin. Moreover, we successfully prepared a toning lotion, "Biomimetic Moisturizer," incorporating both lipids and NMFs, using this technology, and demonstrated its high moisturizing effect and efficacy in improving skin condition.

### New Viewpoints on the Color Differences between Upper and Lower Lips and Proposed Makeup Procedure\*

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Generally, the color of a lip is affected by the amount of hemoglobin and melanin. Further, the lip is medically considered to have two parts, i.e., skin and mucous derived ones. In particular, capillaries of the mucous derived lip are located near its surface so it makes the lip look redder. It is reported that the lip gets dull as capillary condition changes with age. However, those reports have not referred to the color differences between upper and lower lips. In this work, first we evaluated the color of upper and lower lips and confirmed that the latter was redder in any generation. Then we evaluated how the difference in color between upper and lower lips gave impact to the visual effects by changing their colors. Then, we found that the color difference between upper and lower lips gave a great impact to their impression. As a result, it was found that when the color of upper and lower lips was made the same, it gave a natural, young and healthy impression. Formulation of MgTube in the lipstick was found effective to actually adjust the color of upper and lower lips. Further in the case of sheer lipstick, a combination of MgTube and pearlescent pigments was effective. By using these findings, we could develop a new makeup procedure.

Development of Youthful-Looking Makeup Foundation by Controlling Transmitted Light\*

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Based on the factor analysis of facial appearance using facial texture images, it was found that evenness of skin

produced a youthful appearance. We developed a new composite powder which has the optical property to provide 'youthful-looking' skin. Facial images of 161 women volunteers with make-up were prepared, and the appearance of skin and face were evaluated by 15 subjects. The results of correlation analysis showed that 'evenness of skin texture' and 'color evenness' caused a 'youthful impression'. In order to obtain the evenness of skin, we attempted to develop a new powder that has an ideal optical property of transmitted light. Titanium oxide-containing silica/color pigment composite powder prepared by the super critical solution method had effective light transmission, diffusion and chroma saturation. We achieved the production of a youthful appearance by application of the composite powder as an ingredient of a foundation.

