

Abstracts

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Enhancement of Percutaneous Absorption and Its Application to Skincare Products

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Enhancement of percutaneous absorption is one of the most important goals in the development of more effective skin care products. But, qualitative standards for cosmetics are often widely different from standards for medicines from the standpoints of safety, stability, and taste. As a result, current systems of experiments on percutaneous absorption and how percutaneous absorption can be enhanced which have been developed as techniques for medicines, are not adequate to develop skin care products. In this paper each method of detecting percutaneous absorption of ingredients and percutaneous absorption enhancement for the development of skin care products is described from the standpoint of the principle involved and its application.

Analysis of Eye Movement in Skin Assessment

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When you evaluate the appearance of the skin, which part of the face do you pay attention to? The purpose of the present study is to identify the most important part of the face in skin care routines as well as in the use of cosmetics to enhance skin's beauty. A sensory evaluation of 14 attributes of a model's skin as 'rough texture,' 'luster,' and 'smoothness,' in addition to 'skin beauty' as an overall assessment of the skin, was conducted. At the same time, the eye movements of the evaluators was recorded with an eye movement measuring system. The main findings were as follows. For many attributes the evaluators fixated mainly on the cheek region. The nose was also often fixated on, e.g., in the evaluation of prominent pores the fixation

concentrated on the nose on and wings of the nose. These parts fixated on corresponded well with the parts where the evaluators reported that they looked. When subjects were asked to assess luster, fixations tended to be concentrated on the tip of the nose and the cheeks. The part fixated on differed depending on the attributes evaluated. In the evaluation of skin beauty, the fixations were distributed over a wider region, including the upper cheek, the area around the nose, the area around the mouth, and the lower cheek. In conclusion, eye movement during sensory evaluation was elucidated objectively. These findings are not only important for developing skin care and make-up techniques, but also for determining appropriate measurement areas in skin bioengineering techniques.

Partial Difference in Facial Sebum

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Parts of the face where more sebum is secreted are conventionally called Zone T. However, these sites are not always areas where makeup is apt to come off. To verify this idea, we conducted a survey on the feelings of the beauty staff, took sebum measurements from several locations on the face, and observed sebum secretion. The results confirmed that sebum secretion in the individual could be ranked by dividing the face into 19 parts. As a next step, we evaluated the effects of a milky lotion on makeup and its staying power on these parts. Findings indicated that the application of foundation was affected by the sebum secretion of each individual part; thus, makeup fading differed according to location and amount of sebum secretion. Based on these results, we suggest that the nose, the brow, the inward upper cheeks, and the jaws be called Zone I because more sebum is secreted in these places. We also propose that moisture products for base makeup be suitably selected and properly used according to the nature of skin of each person.

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

Optical Investigation of Aging Skin and the Development of Makeup That Restores a Youthful Look

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Commercial makeup can enhance beauty when used on youthful skin. But when the same makeup is applied to aged skin, the result is often artificial and unnatural-looking. To find the cause of this phenomenon, we investigated the optical properties of skin and discovered that they strongly correlate with microtopography of the dermal surface. We learned that lateral diffusion of light on the skin surface is a key contributor to its optical qualities, and that this diffusion is strongly influenced by the condition of the microtopography. Further studies resulted in the discovery of an important optical parameter which we termed "Lateral Diffusion Index" (LDI). Youthful skin, with its more distinct and uniform pattern of micro relief, was found to possess a higher LDI value than does aged skin, with its flatter and more irregular pattern of micro relief. We then confirmed the practical application of our discovery by incorporating specially designed powdered fiber (300 μ m nylon fibers) into an experimental makeup to optimize light diffusion characteristics and substantially increase the LDI value of aged skin. Comparison studies demonstrated this new makeup to be more effective than traditional makeup in making aged skin appear more naturally alive and vibrant.

Properties of the Perfluoroalkylethyl Acrylate (FA) Copolymers and Their Applications for Cosmetics III -Surface Property of SR Polymer-
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Properties of the perfluoroalkylethyl acrylate (FA) /2-hydroxyethyl methacrylate copolymers and their applications for cosmetics was studied. The main conclusions from this study can be summarized as follows: This copolymer made it possible to repel oil both in air and in water. Its behavior was investigated by surface chemistry-based measurement (contact angle, ESCA) used with flat substrate (Al plate). This technique will be applied to prepare cosmetics which are durable against sebum in all environments.

Psychological Effects of Skin Care – From the Perspectives of Somatosensory Function, Emotional Response and Skin Care Condition-Naoyasu Hirao
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A skin care product is valued for not only its effect on the skin but also its positive effects on psychological wellbeing. Examples of such effects are moisturization and relaxation. A skin care produces psychological

effects by stimulating the somatosensory system. Signals received by receptors in the skin influence the activity of the autonomic nervous system, endocrine system and immune system and various emotions are thus evoked. A positive feedback loop is produced by the application of a skin care product: use evokes positive psychological and skin care effects and, in turn, each enhances the effects of the other. This paper discusses the relationship between using a skin care product and the psychological effects of its use from the perspectives of somatosensory function, emotional response and skin care effects.

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Measurement of Dyed Hair Color and Evaluation of Anionic Surfactants on Dyed Hair
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Popularization of hair dyeing and the increase in the number of hair colors have required the development of accurate evaluation methods for dyed hair color. Although color evaluation has been generally carried out by sensory testing with the naked eye, the results have not been satisfactory because this method is not an objective evaluation. In order to develop an evaluation method for the color of dyed hair, we have adopted a color laser-microscope for the measurement of three primary color values. In our study, a correlation between the three primary color values and sensory testing with the naked eye was recognized, suggesting to us that this method by which three primary color values are measured is a useful tool for the evaluation of the color of dyed hair. Furthermore, when we studied the effect of decoloring and damage prevention on dyed hair caused by cleansing with anionic surfactants using the newly developed evaluation technique, we recognized obvious differences among the three anionic surfactants with regard to their decoloring and damage prevention effect. The result showed that treatment with sodium lauroyl hydrolyzed silk caused less decoloring and less hair damage on dyed hair.

Studies for Identifying Prohibited Ingredients Such as Bithionol and Dichlorophen in Cosmetics
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Bithionol (BL) and dichlorophen (DF) are named in the Japanese Pharmaceutical Affairs Act as ingredients prohibited in cosmetics. So the methods for identifying BL and DF by HPLC were investigated. After adding

BL or DF to lotion, milky lotion, body soap or shampoo and diluting with methanol, the extract was analyzed by HPLC using a Unisil Q C18 column (4.6 mm i.d. x 150mm), a mixture of acetonitrile and 50 mM phosphate buffer (pH 3.5) (13:7) for BL or (1:1) for DF as the mobile phase and the detection wavelength of 306 nm for BL and either 227 nm or 286 nm for DF, respectively. In the experiment curves for BL and for DF ranged from 1 to 10 μ g/mL and from 0.1 to 1.2 or 1 to 12 μ g/mL. There was good correlation between the concentration and the peak area of BL or DF. BL and DF added to lotion, milky lotion, body soap or shampoo-except for milky lotion D-were completely determined by HPLC. In the case of milky lotion D, an ingredient in that lotion interrupted the peak of DF on the HPLC chromatogram. So a pre-screening method with a short silica gel column was employed and the DF in milky lotion D was satisfactorily determined by HPLC.

Recent Progress in Skin Bioengineering Techniques and Its Application to Evaluation of Skin Care Cosmetics

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Recently there has been increasing concern about the properties and efficacy of cosmetics because the government regulation of the effects of cosmetic has been eased and the publicizing of the skin care effects of foundations or lipsticks has been officially permitted since April 2001. On the other hand, bioengineering techniques closely related to the substantiation of cosmetics have been well-developed and nowadays the internal structure of human skin and cutaneous cells can be studied non-invasively using the methods. In this

paper I describe a few such techniques, which are in vivo measurement of the microtopography of human skin (texture and wrinkles), in vivo confocal laser microscopy to study depigmentation, optical coherence tomography (OCT) for stratum corneum thickness and epidermal - dermal undulation measurement, and in vivo confocal Raman microspectroscopy for measurement of water distribution in stratum corneum. The possibility of application to efficacy testing of cosmetics is also mentioned.

Sonochemical Effects due to Cavitation Generated by an Ultrasonic Wave Beauty Care Device

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It is not clear whether or not commercial ultrasonic wave devices including beauty care devices, toothbrushes, and washing machines, produce cavitation and sonochemical effects. In our work, the cavitation and sonochemical effects of a commercial ultrasonic wave beauty care device in water and in an aqueous solution of potassium iodide exposed to air were investigated. Nitric and nitrous ions were formed in distilled water under sonication, and their concentration increased with increasing sonication time. When ultrasound was irradiated into the aqueous solution of potassium iodide, the iodide ion was oxidized to a tri iodide ion. This was due to the hydrogen peroxide produced in the solution under sonication. Our results indicated that sonication from ultrasonic wave beauty care device produces cavitation and sonochemical effects in water.