J. Cosmet. Sci., **60,** 47–48 (January/February 2009)

Abstracts

Journal of the Society of Cosmetic Chemists Japan Vol. 42, No. 3, 2008*

A Tentative Mechanism of Oxidative Dyeing for Keratin Fibers

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A number of papers have been published on the oxidation coupling reactions of the active intermediate of a dye precursor with an electron-rich dye coupler. At the present stage, however, little information is available about the oxidative reaction mechanism to colored oxidation products and the dye distribution inside the keratin fibers. From the results of dyeing in the presence of both reducing agent and chelate agent, we found that the coupling reaction developing oxidation dyes occurred on the outer surface in the cuticle cell phase, and that not only the cell membrane complex (CMC) regions play an important role as accumulation regions of the finished dye, but also the components of CMC contribute directly to the oxidation coupling reactions. Furthermore, we suggested from the other results that the metal ions and disulphide bond presented primarily within the intercellular materials play an important role in developing the colored oxidation dye. Then, on the basis of the general scheme of the oxidation dye process, we proposed a tentative mechanistic scheme of oxidative dyeing to account for the oxidation dying phenomenon of keratin fibers. The scheme is made up of four step-reactions.

Enhancing Facial Beauty : Diminishing Tension-Caused Forehead Wrinkles through Upper Back Massage

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The organs and tissues of the human body function together, and many women know that facial skin quality can be influenced by the condition of other areas. From the perspective of esthetics, the condition of other tissues and organs can have significant impact on facial skin. In our lives, increasing numbers of people experience pain and discomfort in the neck and shoulder region ; this study investigates the effects of neck / shoulder pain and discomfort on facial beauty, and demonstrates that facial beauty can be improved by alleviating this pain and discomfort. Shoulder pain and discomfort are correlated to increased shoulder muscle stiffness, increased tension in the frontalis muscle (a muscle of facial expression in the forehead), and forehead wrinkling. We show that body massage aimed at alleviating muscle tension in the neck and upper back alleviate frontalis muscle tension and improve forehead wrinkles. Since other non-facial factors are likely to affect facial beauty, our results show that measures to make the face beautiful and healthy-looking involve the entire body.

Optimizing Performance of Makeup Products by Controlling Surface Free Energy

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

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We investigated the use of Surface Free Energy (SFE) measurements, describing coherence between surfaces of two solids, in evaluation of affinity between skin surface and foundation, a possible predictor of makeup longevity. We found that the gp values of skin varied significantly among subjects. After discovering that the SFE values of most available conventional foundation products were very different from that of skin, specially formulated experimental foundations with SFE values close to that of the skin surface were prepared using conventional powder ingredients and novel powder ingredients coated with polyethylene glycol. In our usage tests, the SFE-controlled foundations demonstrated superior performance to that of conventional foundations and most of subjects preferred the SFE-controlled foundations. Examination with a digital microscope revealed that SFE-controlled foundations adhered evenly all over the skin surface, while conventional foundations tended to localize on the skin surface, offering support to the usage test result. Key words : surface free energy, contact angle, adherability, skin properties, surface treatment, makeup foundation

Development of Longwearing Lipstick Using Inorganic-organic Hybrid Aggregate

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As a popular method for longwearing lipsticks, self-organizing polymers (e.g. glyceryl ether modified dimethicone (GE)), which can form a gel with a small amount of water are used. However, these polymers have the defect that they tend to inhibit the dispersibility of pigments, especially in a lipstick containing a large amount of liquid isoparaffin that has high moisturizing properties. In this study, the compatibility of the longwearing property and the high dispersibility of pigments in isoparaffin-rich lipstick has been investigated. The introduction of alkyl chain moieties to the GE structure markedly improved the pigment dispersibility. However, random copolymerization type structure inhibited the longwearing properties. On the other hand, the introduction of an alkyl chain to the both ends of GE did not affect the longwearing properties. For further improvement of the pigment dispersibility, fine silica particles were investigated as a dispersant. The compatibility of longwearing properties and good dispersibility of pigments was achieved with silica particles. TEM observation and 1H-NMR measurement revealed that GE was absorbed on silica particles and the silica formed a network in the lipstick composition. We assume that this organic-inorganic hybrid aggregate has no adverse effect on the properties of pigments in the lipstick, hence no flocculation of pigments occurs.

Establishment of Ex Vivo Stratum Corneum Lipid Ordering Analysis by Electron Spin Resonance

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Electron spin resonance (ESR) spectra have been used for studying stratum corneum (SC) lipid ordering. Order parameter S obtained from ESR spectra is a good index for evaluating the fluidity of SC lipids in vitro. However, the method for evaluation of ex vivo SC lipids has not been established. A glass plate using a cyanoacrylate resin was used to strip the SC lipids. A single-chain aliphatic spin probe, 5-Doxylstearic acid (5-DSA), was used. The SC samples were incubated in the 0.001% 5-DSA in a 0.1% ethanolic aqueous solution for 60 min at 37°C. After the incubation, the excess spin probe was removed with distilled water, and then an ESR glass holder with the incubated SC sample was mounted in the ESR cavity. The newly designed ESR glass holder improved accuracy and reproducibility of sample preparations as well as ESR measurements. In conclusion, we have optimized the preparation method of ex vivo SC specimen and established accurate ex vivo ESR analyses of SC lipid ordering.