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Abstracts

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Applications of Phospholipid to Cosmetics

Yoshikazu Konno

Skin-care Product Development Laboratories, Research Laboratories, KOSÉ Corporation, 48-18, Sakae-cho, Kita-ku 114-0005, Japan

In this report, the properties of phospholipid both as a cosmetic material and as an emulsifier, the fine emulsion with phospholipid and the formulations utilizing molecular assembly with phospholipid are described. The chemical stability of phospholipid needs to be maintained by controlling its molecular structure, since it is derived from natural substances. Phospholipid worked as a useful emulsifier by adjusting the rate of PC, PE, PI, PS. Moreover, it was possible to prepare fine emulsions with a combination of phospholipid and non-ionic surfactant. Liposome and Sheet Lamellar Gel, which was based on lamellar structure, had unique properties and high skin effect.

Evaluation of Tactile Sensation Using Kansei Measurement

Masayoshi Kamijo

Interdisciplinary Graduate School of Science and Technology, Shinshu University, 3-15-1, Tokida, Ueda 386-8567, Japan

This paper presents topics of the method of evaluating tactile sensation of the industrial product such as clothes or cloth goods using Kansei measurement. Generally, when buying clothes or cloth goods, consumers will evaluate the clothing comfort such as tactile sensation, clothing pressure and microclimate in clothes. The tactile sensation is the important factor to decide the product's value. So far, the tactile sensation has been evaluated by sensory evaluation or physical properties of the material. However, the tactile sensation isn't completely evaluated on these bases. Recently, a measurement of physiological response has emerged as a physical criterion to describe the tactile sensation. The physiological response has the following advantages : (1) The mental stress by touch can be measured in the unconscious state. (2) Time series analysis of the tactile sensation is possible. In this paper, we introduce research topics that have investigated creating evaluation criteria using physiological response such as the electroencephalogram, electrocardiogram and activity of the autonomic nervous system.

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A Novel Method Using a Keratin Film for Quantifying the Photo-Modification of Hair Proteins

Tomoyuki Kawasoe*, Tomoko Watanabe*, Toshihiro Fujii**

*Shiseido Co., Ltd Research Center, 2-2-1, Hayabuchi, Tsuzuki-ku, Yokohama 224-8558, Japan **Faculty of Textile Science and Technology, Shinshu University, 3-15-1, Tokida, Ueda 386-8567, Japan

We have developed a method to detect UV-dependent formation of carbonylated proteins in human hair using fluorescein-5-thiosemicarbazide (5-FTSC) and fluorescent microscopy. In this study, hair keratin films consisting of α-keratin and keratin-associated proteins (KAPs) were prepared and utilized as a substitute device for a hair sample. When the fluorescence intensity was observed in the hair keratin films after irradiation with UV rays, the formation of carbonylated proteins in the hair keratin film prepared by the pre-cast method was higher than that of keratin films prepared by other methods. The fluorescent intensity was increased in proportion to the irradiation time with a high coefficient of correlation (R^2= 0.97) and this became evident within 10 min of irradiating the film. The sensitivity of 5-FTSC in the keratin film was approximately 6-fold higher compared with that of hair samples. The keratin film was sensitive to both UVA and UVB exposures. Immunoblot analysis also showed that the increase of oxidative proteins from the keratin films was observed in the film irradiated over 120 min. The sensitivity, however, was low compared with the fluorescent microscopic observation. Fourier-transform infrared measurement showed that the formation of cysteic acid was detected in the film irradiated for 240 min, though that of carbonyl compounds was not.

Development of a Novel Adhesive Polymer and Its Application to Hairstyling Products

Tomonori Toyoda*, Takumi Kurashima*, Taizo Fujiyama*, Izumi Sasaki*, Kazuyuki Miyazawa*, Hideki Shimizu**, Masato Matsumura***, Takuya Furuta***

*Shiseido Co., LTD. Research Center, 2-2-1, Hayabuchi, Tsuzuki-ku, Yokohama 224-8558, Japan **Shiseido Co., LTD., 1-6-2, Higashishinbashi, Minato-ku, Tokyo 105-8310, Japan ***Goo Chemical Co., LTD., 58, Ijiri, Iseda-cho, Uji 611-0043, Japan

Hairstyling products have evolved with the changes in fashion and hairstyling trends. Generally, hairstyling products are evaluated by their hair-holding and hair-arranging abilities. However, since these two factors are contradictory, it is difficult to improve these functions concurrently. For giving the dual function to hairstyling products, we have developed polyacrylate crosspolymer-3 as a new hairstyling polymer having an adhesive ability as a unique character. Conventional hairstyling-polymers (for example, acrylic polymers or vinyl polymers) are designed in order to maintain hair-styles. Those polymers are good at holding hairstyle, but suitable for neither hair-arranging nor re-arranging. In order to give a hair-styling polymer good hair-arranging and strong hair-holding abilities, we ventured to take advantage of the "adhesive ability" which is recognized as an uncomfortable sticky property in conventional hairstyling products. By designing the molecular structure to have crosslinks and low glass transition temperature, we succeeded in achieving an adequate adhesive ability. This unique polymer allows us to develop new hairstyling products for post hair waxes.

Dispersibility and Hydrophobicity of a Novel Oil Dispersion Containing Fluoro-Compound Surface Treatment Zinc Oxide and Its Application to Sunscreen

Akio Hamamoto, Sanae Kawashima, Masakazu Kobashi

Daito Kasei Kogyo Co., Ltd., 1-6-28, Akagawa, Asahi-ku, Osaka 535-0005, Japan

Generally speaking, it is said that fluoro-compound treated powder does not show good compatibility with oil binders in cosmetics. However, especially, in the case of tri-decafluoro octyltriethoxysilane (TDFOS), we have found a very good dispersing system with an oil binder. In this work we report the evaluation of this novel fluoro-compound treated ultra-fine zinc oxide (ZnO) dispersion compared with a methylhydrogen polysiloxane (MHPS) treated one. We prepared treated ultra-fine zinc oxides with TDFOS or MHPS. As a dispersant, we chose dimethicones modified with polyglycerin (PGSI) or polyether (PESI), and as a dispersed medium, polydimethyl siloxane (PDMS). As the result, the TDFOS-ZnO/PGSI dispersion systems showed good dispersibility and higher hydrophobicity in application. Furthermore, the best dispersion system was the dispersion containing 5 wt%of PGSI. In this system, although in the initial state the viscosity was relatively high, the viscosity became stable at

a lower level after a certain period of time. In the formulations of these dispersions in sunscreen products, the dispersion which is TDFOS-ZnO／PGSI 5 wt%gave the best performance, namely stable lower viscosity and higher hydrophobicity in application to skin. Moreover, the whitening effect in water in application to skin was much less with this system and the feeling during application became the smoothest.

Ingredient for Hair Conditioning and Non-Buildup Effect

Ayako Koyanagi, Yasuko Matsui, Takao Tokano, Masato Yoshioka

Seiwa Kasei Co., Ltd., 1-2-14, Nunoichi-cho, Higashiosaka 579-8004, Japan

Amodimethicone, one of the silicone derivatives that have an excellent effect on hair conditioning, is widely used for hair care products. However, it is a problem that the feeling of the hair is ruined because amodimethicone accumulates on the hair surface when it is applied continuously (a phenomenon called"build-up"). In this study, we checked whether hydrolyzed silk PG-Propyl Methylsilanediol Crosspolymer (HPS), which consists of hydrolyzed silk protein, silicone and an alkyl group, suppressed the build-up of amodimethicone by mixing it with a conditioner containing amodimethicone. As results of the measurement of silicone quantity using an EDS (energy dispersive X-ray spectrometer) and sensory evaluation, we found that HPS suppressed the build-up of amodimethicone and maintained a good texture to the hair.