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Evaluation of reactivity between cosmetic ingredients and container materials

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In food and cosmetics, the stability of the contents may be affected by its container. The evaluation of the reactivity between raw materials and the container material can predict the changes in the preservative efficacy of the finished product. Furthermore, the optimal preservation system can be applied considering the material of the container. We selected seven plastic materials that are frequently used in cosmetics and evaluated the reactivity with six cosmetic raw materials that affect the preservation. The level of the reaction between the two substances was evaluated using O.D. (optical density) value. Among the seven materials, Surlyn was most reactive with cosmetic ingredients. Surlyn is an ionomer in which ethylene-co-methacrylic acid polymer is neutralized with Na⁺ ion and is mainly used in blow containers. In addition, it has been confirmed that amorphous and hydrophobic resins are highly reactive with glyceryl caprylate, ethylhexylglycerin and caprylyl glycol, which have high log P values. The absorbance of caprylyl glycol solution containing AS, increased more than 1.5 times as compared with control, which is probably due to the dissolution of AS resin in caprylyl glycol solution. Studies have shown that AS is also soluble in sunscreens and ester oils. Further studies are required through the use of antimicrobial or challenge tests to confirm that the reaction results between the plastic specimens - preservatives in the O.D. values are consistent with actual preservation reduction in cosmetics. Since the reactivity may vary depending on the characteristics of products, it may be more beneficial to reflect the prescription amount of the ingredients. Changes in the O.D. value of the cosmetic raw materials by the container specimens are easy to identify delicate differences in the reaction. However, the raw material having a high transparency in aqueous solution has a limitation in experimenting with the O.D. value.

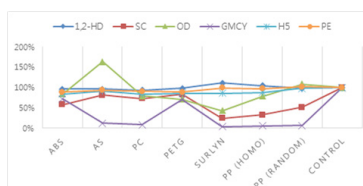


Figure: The O.D. value ratio of the aqueous solution of cosmetic ingredients containing the plastic specimen after a week

Recent Publications

1. So Young Kim, Sa Ryong Yoon, SongI Han, Yuna Yun and Kwang-Hwan Jung (2014) A role of anabaena sensory rhodopsin transducer (ASRT) in photosensory transduction. *Molecular Microbiology* 93(3): 403-14.
2. K Shin, Y Yun, S Yi, H G Lee, J C Cho, K D Suh, J Lee and J Park (2013) Biofilm-forming ability of staphylococcus aureus strains isolated from human skin. *Journal of Dermatological Science* 71(2): 130-137.
3. 3. Kyeho Shin, Tae Ryong Lee, Enyoung Lee, Yoon Hyeok Jeong, Yuna Yun, Tae Hun Park, Hankon Kim, Kashif Ghafoor and Jiyoung Park(2011) Staphylococcus aureus in relation to physical, physiological and subjective conditions of apparently normal skin. *Journal of Dermatological Science* 63(3): 201-20.

Biography

Yuna Yun has completed her B S degree in Life Science and M S degree in Protein Biochemistry from Sogang University, Seoul, Korea, in 2006 and 2008, respectively. Her area of research includes microbiology and preservatives in Amore Pacific Co., a cosmetic company in Korea for 10 years. She has been sympathetic to the hazards of conventional preservatives and consumer concerns and has been involved in the development of non-preservatives cosmetics and safe preservatives. She also studied the reactivity of cosmetic raw materials and containers to ensure long-term stability of cosmetics.