

〈一般論文〉

アミノ酸誘導体を用いた毛髪脱色時のダメージ軽減手法

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Damage Reduction Technique for Hair Bleaching Using Amino Acid Derivative

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Abstract

Our research team investigated the mechanism whereby 2-(2-aminoethylthio) succinate (ATS) mitigates damage during bleach treatment. Hair bundle samples were bleached for 30 min, and then immersed in ATS or maleic acid solution for ten minutes and compared to a blank treatment immersed in ultrapure water. The bleaching and immersion processes were repeated five times. In the reflectance measurements, the color appearance was evaluated in the $L^*a^*b^*$ space, and no differences were observed between the treatment methods. SEM observations revealed that while cuticle detachment was observed in some samples during normal bleaching, it was not observed in samples treated with ATS. ATS treatment suppressed bleach-induced reduction in hair-breaking strength. These results support previous reports of ATS cross-linking in the hair. The inhibitory effect of bleaching treatment on the formation of cysteic acid on the hair surface, as well as on the removal of 18-MEA, was demonstrated by infrared attenuated total reflectance measurements. The melting temperature of keratin under both dry and wet conditions tended to increase with ATS treatment, suggesting that this cross-linked structure formation strengthens the structure. The present results suggest that the inhibition of bleaching damage by ATS is based not only on the effect on the hair surface, but also on strengthening the internal structure of the hair. A mechanism similar to that of maleic acid was assumed, however, further mechanistic clarification is required. The results are expected to contribute to the development of hair color materials with less damage in the future.

Key words: hair bleach, damage reduction, amino acid derivative, tensile test.