

〈一般論文〉

フラーレン類の抗酸化能評価および汎用化粧品成分の
光分解抑制効果

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**Evaluation of Antioxidant Activity of Fullerenes and Their Inhibition
Effects on Photodegradation of Cosmetic Ingredients**

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Abstract

In view of the useful application of fullerenes in the field of cosmetics, the antioxidant activity of fullerenes was estimated as compared with other common antioxidants by employing a carotenoid (β -carotene, astaxanthin) bleaching method. The β -carotene bleaching method demonstrated that the antioxidant activity of polyvinylpyrrolidone (PVP)-complexed fullerenes, PVP/fullerenes, was higher than those of isoflavone, coenzyme Q10, quercetin, curcumin, a vitamin C derivative, and α -lipoic acid, but lower than those of vitamin E and catechin for the lipid peroxide derived from linoleic acid. By contrast, the highest activity was attained by PVP/fullerenes for the ultraviolet irradiation. PVP/fullerenes also showed the highest activity under the ultraviolet irradiation on the astaxanthin bleaching method. It was also noted that PVP/fullerenes protected hydroquinone, vitamin C, and a sunscreen 'avobenzene' from their photodegradation on visible light and/or ultraviolet irradiation. However, PVP/fullerenes were not effective against photodegradation of sodium L-ascorbate-2-phosphate (APS), catechin, vitamin E, and retinol. These findings indicate that fullerenes scavenge semiquinone and ascorbate radicals derived from photooxidative degradations of quinone and ascorbate moiety. The present results imply that fullerenes can exert antioxidant activity against carotenoid compounds and also prevent photodegradation of some cosmetic ingredients.

Key words: fullerene, antioxidant, carotenoid, photodegradation.