Quantitative Analysis for Common Sunscreen Agents in Cosmetics by HPLC

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ABSTRACT

A simplified quick and reliable high performance liquid chromatography (HPLC) method for the quantitative analysis of common sunscreen agents (2-phenylbenzimidazole-5-sulfonic acid, benzophenone-3, diethylamino hydroxybenzoyl hexyl benzoate, octocrylene, 2-ethylhexyl-p-dimethyl amino benzoate, octyl methoxycinnamate, butyl methoxydibenzoylmethane, octyl salicylate and homosalate) in cosmetics was developed in this study. Nine sunscreen standards and samples were extracted with methanol solution, followed by HPLC analysis. The HPLC was performed on a LiChrospher® 100 C18 (4.0 mm × 250 mm) column using methanol and 0.1% acetic acid (9 : 1, v/v) as the mobile phase at a flow rate of 0.8 mL/min and injection volume was 20 μL. The run time was 20 min and the chromatography was monitored by absorbance at 310 and 350 nm. The linear coefficients of regression equation of nine sunscreen agents were 0.99605-1.00000. The relative standard deviations of 9 sunscreen agents ranged between 0.02-6.93% (intraday) and 0.03-6.51% (interday). Recovery analysis was performed by spiking standard compounds into blank samples. The recoveries of 9 sunscreen agents were 82.42-118.34% and the coefficients of variation were 0.07-4.23%. The quantity limits and detection limits of 9 sunscreen agents were 0.002-0.005% and 0.0007-0.0015%, respectively. As a whole, this method was well qualified for the quantitative analysis of 9 sunscreen agents in commercial cosmetics.

Key words: 2-phenylbenzimidazole-5-sulfonic acid, benzophenone-3, diethylamino hydroxybenzoyl hexyl benzoate, octocrylene, 2-ethylhexyl-p-dimethyl amino benzoate, octyl methoxycinnamate, butyl methoxydibenzoylmethane, octyl salicylate, homosalate, HPLC