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Simultaneous determination of phenylenediamines derivatized with 5-(4, 6-dichlorotriazinyl) aminofluorescein by capillary electrophoresis

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Phenylenediamines were ingredients that were used as permanent hair dyes. These compounds were reported to cause allergic dermatitis and have genotoxicity and carcinogenicity. The fluorescent derivatization strategy and micellar electrokinetic chromatography with laser-induced fluorescence detector (MEKC-LIF) were established to analyze o-phenylenediamine (OPD), m-phenylenediamine (MPD), p-phenylenediamine (PPD) and toluene-2,5-diamine (PTD) in hair dye products, hair samples and percutaneous absorption experiment. 5-(4,6-dichlorotriazinyl) aminofluorescein (DTAF) was used as a fluorescent reagent and derived at amino groups of phenylenediamines and underwent nucleophilic substitution reaction. The derivatization condition reacted at 90°C for 10 minutes in alkaline conditions. The derivatives were analyzed by MEKC equipped with LIF detection. The limit of detections (S/N=3) for MPD, PTD, PPD and OPD were 25, 25, 50 and 100 nM, respectively. Comparing to previous studies, the sensitivity enhancements were 30-81-fold. The high sensitive MEKC-LIF method was successfully established and applied to determine the content of phenylenediamines in commercial hair dye products, hair and percutaneous absorption samples.

Biography

Yen-Ling Chen was associate professor, Department of Fragrance and Cosmetic Science, College of Pharmacy, Kaohsiung Medical University, Kaohsiung, Taiwan. He is doing PhD in School of pharmacy, College of Pharmacy, Kaohsiung Medical University, Kaohsiung, Taiwan. His research interest includes cosmetic analysis, pharmaceutical and biomedical analysis, clinical DNA examination, capillary electrophoresis

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