

عنوان مقاله:

Quantitative determination of formaldehyde in cosmetics using a solid-phase microextraction–mass spectrometry method

محل انتشار:

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خلاصه مقاله:

Formaldehyde is a commonly found ingredient in cosmetic products. It is used to preserve cosmetic raw materials, or it is liberated by a formaldehyde-donor in consumer products. Based on its hydrophilic property, it is fairly common to find it in watery concoctions like shampoos, conditioners, shower gels, etc. For the assessment of formaldehyde in cosmetics, derivatizations prior to detection by a chromatography or a spectroscopic technique are commonly employed. SPME is a simple, effective adsorption–desorption and environment-friendly technique that eliminates the need for solvents or the aggravation of concentrating volatile or semi-volatile compounds [8]. Controlling and monitoring the analyte parameters of temperature, time and technique are critical to accomplish a quantitatively reproducible SPME result. The contribution of the present work combines the application of the SPME with mass spectrometry for the determination of formaldehyde in shampoo. In this work, formaldehyde is first derivatized with pentafluorophenyl hydrazine (PFPH) in situ. The formed hydrazone is adsorbed over a poly(dimethylsiloxane) divinylbenzene-coated fiber and analyzed using gas chromatography–mass spectrometry. The adsorption–time profiles and salting effect were studied. The precision, recovery and detection limits were determined with spiked samples. The relative standard deviations from different spiked shampoo samples were all less than 10% and the recoveries were between 89.00 and 101.23%. The limit of detection was of 4mg/l. Compared with other techniques, the study shown here provides a simple, fast and reliable method for the analysis of formaldehyde in shampoo.

کلمات کلیدی:

Formaldehyde, cosmetic, GC/MS

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