

研究论文

同位素稀释液相色谱-串联质谱法测定化妆品中的N-亚硝基二乙醇胺

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摘要 建立了化妆品中N-亚硝基二乙醇胺(NDELA)的同位素稀释液相色谱-串联质谱分析方法。水溶性化妆品样品以水为提取溶剂提取,样品提取液经高速离心处理后,上清液过Oasis HLB固相萃取柱净化。脂溶性化妆品样品用二氯甲烷和水混合溶剂进行液-液分配萃取。NDELA经Waters Atlantis T3色谱柱(150 mm×2.1 mm, 3 μm)分离后在多反应监测模式下进行串联质谱定性及定量分析,以d8-NDELA为内标定量。NDELA的方法定量限为50 μg/kg;在50-250 μg/kg的3个添加水平范围内的平均回收率为89.1%~98.2%,日内精密度均小于9%,日间精密度均小于11%。该方法能够满足化妆品中NDELA的检测要求。

关键词 [同位素稀释](#) [液相色谱-串联质谱](#) [N-亚硝基二乙醇胺](#) [化妆品](#)

Determination of N-nitrosodiethanolamine in cosmetics by isotope dilution-liquid chromatography- tandem mass spectrometry

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Abstract

A comprehensive analytical method based on isotope dilution-liquid chromatography-tandem mass spectrometry has been developed for the determination of N-nitrosodiethanolamine in cosmetics. Water-soluble cosmetic samples were extracted with water. The extract was centrifuged, then the upper solution was cleaned up by an Oasis HLB solid phase extraction cartridge. Oil-soluble cosmetic samples were extracted by liquid-liquid partition with dichloromethane and water. Qualitative and quantitative analyses were carried out for the analyte under the multiple reaction monitoring (MRM) mode after the chromatographic separation on a Waters Atlantis T3 column (150 mm×2.1 mm, 3 μm). The quantitation was performed with deuterated N-nitrosodiethanolamine as internal standard. The limit of quantitation (LOQ) for N-nitrosodiethanolamine was 50 μg/kg. The mean recoveries were 89.1%~98.2% at the spiked levels of 50~250 μg/kg, with the intra-day precision less than 9% and the inter-day precision less than 11%. The method is suitable for the determination of NDELA in cosmetics.

Key words [isotope dilution](#) [liquid chromatography-tandem mass spectrometry](#) [N-nitrosodiethanolamine](#) [cosmetics](#)

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