

研究论文

新型纳升级毛细管刻蚀电喷雾质谱接口研究

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摘要 对普通石英毛细管表面使用氢氟酸刻蚀技术进行刻蚀, 并与商品化鞘流液毛细管电泳-质谱接口(Sheathflow CE-MS interface)结合, 将其改装成一种新型的纳升级电喷雾质谱接口. 玻璃膜接口部分呈多孔结构, 壁厚约10 μm . 以细胞色素c对新型接口加以评价, 样品的流量最低可达到20 nL/min; 在50~500 nL/min流量范围内刻蚀接口具有较高的响应信号. 考察了接触电解质溶液对样品电离的影响; 比较微升级不锈钢接口和新型接口的蛋白质检测结果发现, 在流速为200 nL/min时, 检测灵敏度可以提高3.6倍.

关键词 [质谱](#) [电喷雾接口](#) [氢氟酸刻蚀](#) [蛋白质检测](#)

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Nanoliter-scale Etched Capillary Electrospray Interface of Mass Spectrometry

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Abstract A nanoliter-scale electrospray interface for mass spectrometry was developed by modifying the commercial sheathflow interface for capillary electrophoresis coupling with mass spectrometry(CE-MS). The interface was fabricated by using HF etching on a 50 μm i.d. fused-silica capillary. The outer wall of the interface was shown a porous structure, and its thickness was as thin as about 10 μm . A protein sample, cytochrome c, was analyzed by using the etched interface at the volumetric flow rate as low as 20 nL/min. The influence of contacting electrolyte between the etched capillary and the stainless steel sheath tube on ESI was investigated and explained. The comparative study of electrospray performance of the commercial micro stainless steel interface and the etched one was carried out by using protein as sample. The higher response signal was achieved by using the modified interface in the flow rate range of 50—500 nL/min. The sensitivity of detection was increased 3.6 times at the flow rate of 200 nL/min compared with the commercial micro interface.

Key words [Mass spectrometry](#) [Electrospray interface](#) [HF etching](#) [Protein detection](#)

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