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特别策划

甲基丙烯酸酯整体柱毛细管电色谱法快速分析白芷中的主要活性成分

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摘要 以甲基丙烯酸酯整体柱为分离柱, 建立了一种快速分离、分析白芷药材提取物中的主要活性成分欧前胡素(imperatorin)、异欧前胡素(isoimperatorin)、珊瑚菜内酯(phelloptorin)和发卡二醇(falcarindiol)的毛细管电色谱(CEC)方法。在整体柱制备实验中对三元致孔剂组成成分的比例进行了系统的考察。在分离实验中对流动相的组成(包括有机相组成、缓冲液浓度和缓冲液的pH值)进行了优化。最终的优化条件为: 流动相为乙腈-20 mmol/L NaH2PO4(pH 4.95)(50:50, v/v), 分离电压为－25 kV。结果表明, 所制备的甲基丙烯酸酯毛细管整体柱具有良好的渗透性和重现性;4种分析物的标准曲线线性关系良好(r2＞0.997), 检出限均小于0.34 mg/L, 加样回收率为95.18%～98.44%。该方法快速、简便、可靠。应用该方法对18个不同产地的白芷样品进行了测定, 并对其药材质量进行了评价。

关键词 甲基丙烯酸酯整体柱 毛细管电色谱 欧前胡素 珊瑚菜内酯 发卡二醇 异欧前胡素 白芷

Fast determination of active components in Angelica dahurica extract using capillary electrochromatography with methacrylate ester-based monolithic columns

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Abstract

The separation and determination of four important active components (imperatorin, isoimperatorin, phelloptorin and falcarindiol) from Angelica dahurica extract has been performed using capillary electrochromatography (CEC) with a methacrylate ester-based monolithic column. The effect of the porogen ratio on the column preparation was studied. The mobile phase composition, such as the concentration of organic solvent, the ionic strength and the pH of the buffer were also optimized. Under the optimized conditions (50% acetonitrile and 50% of a 20 mmol/L sodium dihydrogen phosphate electrolyte at pH 4.95, －25 kV), a fast and baseline separation of the four analytes was achieved. The calibration curves showed a good linearity (r2 ＞0.997) and the limits of detection were lower than 0.34 mg/L. The mean recoveries of the studied components ranged between 95.18% and 98.44%. The method developed is sensitive, reliable and suitable for the quality control. With this CEC system, the quality of Angelica dahurica extracts from 18 various regions was evaluated.

Key words methacrylate ester-based monolithic column capillary electrochromatography (CEC) imperatorin phelloptorin falcarindiol isoimperatorin Angelica dahurica

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