

反相高效液相色谱法定量分析木质素的主要降解产物

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Determination of main degradation products of lignin using reversed-phase high performance liquid chromatography

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摘要 建立了反相高效液相色谱法定量分析玉米秸秆蒸汽爆破预处理过程中产生的主要木质素降解产物的方法。采用C18色谱柱,柱温30℃,乙腈-水(含1.5%的醋酸)为流动相,梯度洗脱,流速为0.8 mL/min, 254 nm和280 nm波长下紫外检测,可实现4-羟基苯甲酸、香草酸、紫丁香酸、4-羟基苯甲醛、香草醛和紫丁香醛的有效分离。6种主要木质素降解产物线性回归方程相关系数为0.9999~1.0000,加标回收率均在96%以上,相对标准偏差低于2.5%(n=6),满足定量分析要求。

关键词: 反相高效液相色谱 酚类化合物 降解产物 木质素 玉米秸秆

Abstract: An analytical method using reversed-phase high performance liquid chromatography (RP-HPLC) was developed for the separation and quantitative determination of main degradation products of lignin (4-hydroxybenzoic acid, vanillic acid, syringic acid, 4-hydroxybenzaldehyde, vanillin and syringaldehyde) during the steam exploded pretreatment for corn stovers. The separation was carried out on a C18 column with the mobile phase of acetonitrile-water (containing 1.5% acetic acid) at 30 °C at a flow rate of 0.8 mL/min and the detection wavelengths of 254 and 280 nm. Under the optimized conditions, the correlation coefficients of the 6 compounds were between 0.9999 and 1.0000. The recoveries of the 6 compounds were all above 96% and the relative standard deviations (n=6) were less than 2.5%. This method is suitable for the determination of the main degradation products of lignin during the steam exploded pretreatment of lignocellulosics.

Keywords: reversed-phase high performance liquid chromatography (RP-HPLC) phenolic compounds degradation products lignin corn stovers

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