

研究论文

前沿分析法研究对-羟基苯甲酸印迹整体柱的热力学行为

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摘要 采用矩形前沿分析法对原位聚合的对-羟基苯甲酸印迹整体柱的热力学吸附等温线进行了测定. 印迹整体柱的吸附等温线是分别以乙腈、甲醇、四氢呋喃和含有体积分数分别为1%, 3%, 5%和7%乙酸的乙腈为流动相以及在以甲醇为流动相时柱温分别为20, 40和50 °C的条件下测定的. 吸附等温线表明, 印迹整体柱对模板分子的吸附能力比其结构类似物(邻-羟基苯甲酸)的吸附能力强. 用双Langmuir方程对不同条件下得到的实验数据进行拟合, 得到模板分子和邻-羟基苯甲酸在印迹整体柱各种吸附位点上的饱和吸附量和键合常数, 结果表明, 流动相中乙酸含量、有机溶剂的性质和柱温对模板分子容量因子的影响比对邻-羟基苯甲酸的大, 造成印迹聚合物的选择性随条件的变化而发生了明显的改变.

关键词 [前沿分析法](#) [对-羟基苯甲酸](#) [印迹整体柱](#) [吸附等温线](#)

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Thermodynamic Studies on 4-Hydroxybenzoic Acid-imprinted Polymer Monolith by Frontal Analysis

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Abstract The adsorption isotherms of 4-hydroxybenzoic acid imprinted monolith which was prepared by *in situ* therm-initiated polymerization were determined with the frontal analysis successfully. Adsorption isotherms of the monolith were measured at 20, 40 and 50 °C by using acetonitrile, tetrahydrofuran, methanol and acetonitrile containing 1%, 3%, 5% and 7% (volumn fraction) acetic acid as the mobile phase, respectively. The results show that the adsorption capacity of the monolith for the template was found to be much stronger than 2-hydroxybenzoic acid. The experimental data was fitted by Bi-Langmuir isotherm, and the saturation capacity and association constant of imprinted monolith was achieved. The content of acetic acid in the mobile phase, the nature of the organic mobile phase and the temperature showed some influence on the adsorbent ability and selectivity of the imprinted polymer. This phenomenon can be explained that the saturation capacity and association constant of 4-hydroxybenzoic acid on the binding sites was influenced by the chromatographic conditions much more significantly than 2-hydroxybenzoic acid.

Key words [Frontal analysis method](#) [4-Hydroxybenzoic acid](#) [Imprinted polymer monolith](#) [Adsorption](#)

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