

七(2,3,6-三-O-甲氧甲基)-β-环糊精的合成及其在气相色谱分离中的应用

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Synthesis of heptakis(2,3,6-tri-O-methoxymethyl)-β-cyclodextrin and its application in gas chromatography

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摘要 将甲氧甲基引入β-环糊精的2,3,6-位合成了新的气相色谱手性固定相七(2,3,6-三-O-甲氧甲基)-β-环糊精,并采用静态法将其涂渍在毛细管内壁制备毛细管气相色谱柱。考察了毛细管柱的柱性能和分离性能。结果表明该固定相对GroB试剂、苯的二取代位置异构体(硝基甲苯、溴甲苯、二氯苯和二甲苯)及手性化合物(2-羟基丙酸甲酯、2-羟基丙酸乙酯和2-甲磺酰基丙酸甲酯)都具有良好的分离效果。与固定相2,3,6-三-O-甲基-β-环糊精的手性分离效果对比,结果显示两种手性固定相的分离能力各异,对一些手性脂类化合物对映体的分离存在互补性。

关键词: 环糊精衍生物 固定相 毛细管气相色谱 位置异构体 手性化合物

Abstract: A new chiral stationary phase for gas chromatography, heptakis(2,3,6-tri-O-methoxymethyl)-β-cyclodextrin, was synthesized by substituting the 2,3,6-OH groups of β-cyclodextrin with methoxymethyl groups, and a coated capillary column for gas chromatography was made by coating this new stationary phase with static method. The chromatographic properties and separation abilities of the prepared stationary phase were studied. The test results showed that it possessed good separation abilities to Grob test mixture, disubstituted benzene isomers (e.g. nitrotoluenes, bromotoluenes, dichlorobenzenes, dimethylbenzenes) and some chiral compounds such as methyl 2-hydroxypropionates, ethyl 2-hydroxypropionates, methyl 2-methylsulfonylpropionates. The comparison of chiral separation results between 2,3,6-tri-O-methoxymethyl-β-cyclodextrin and 2,3,6-tri-O-methyl-β-cyclodextrin showed that the separation abilities of the two stationary phases were different and complementary to each other for some chiral ester enantiomers.

Keywords: cyclodextrin derivatives stationary phase capillary gas chromatography (CGC) positional isomers chiral compounds

Received 2010-09-15; published 2011-01-21

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引用本文:

尹明明¹, 朱小波², 刘勇良¹, 钟江春³, 陈福良^{1*}. 七(2,3,6-三-O-甲氧甲基)-β-环糊精的合成及其在气相色谱分离中的应用[J] 色谱, 2011, V29(01): 91-94

YIN Mingming¹, ZHU Xiaobo², LIU Yongliang¹, ZHONG Jiangchun³, CHEN Fuliang^{1*}. Synthesis of heptakis(2,3,6-tri-O-methoxymethyl)-β-cyclodextrin and its application in gas chromatography[J] Chinese Journal of Chromatography, 2011, V29(01): 91-94

链接本文:

http://www.chrom-china.com/CN/10.3724/SP.J.1123.2011.00091 或 http://www.chrom-china.com/CN/Y2011/V29/I01/91

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