

聚二乙烯苯整体柱的制备及其在气相色谱分析中的应用

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Preparation of divinylbenzene polymer monolithic column and its applications in gas chromatography

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摘要 初步探讨了毛细管整体柱的制备方法及其在气相色谱分析中的应用。以液相色谱用毛细管整体柱作为研究基础,通过改变甲苯和十二醇的比例,使整体柱适用于气相色谱分析。通过二乙烯苯与键合在管壁上的3-(异丁烯酰氧)丙基三甲氧基硅烷(TMP)键合以及其自身的聚合,获得具有牢固结构、良好机械强度的整体柱。将其用于混合溶剂的分析和白酒标样的分析,可直接分析水中低碳醇。与现有的商品柱进行比较,结果表明所制备的整体柱均优于用以对照的商品色谱柱,其中在混合溶剂的分析中,醇类、酯类、酮类和芳烃类的峰形均优于用于比较的多孔层开口管(PLOT)柱;在白酒标样分析中,使得乙醛、甲醇、乙酸乙酯的色谱峰能够分开,比现有的聚乙二醇(PEG-20M)柱的分析方法更为便捷。

关键词: 气相色谱 整体柱 聚二乙烯苯 制备 应用

Abstract: The preparation of divinylbenzene polymer monolithic columns and their applications in gas chromatography (GC) are discussed. Based on liquid chromatographic (LC) monolithic columns, the high-permeable monolithic columns can be applied in GC through changing the ratio of toluene and dodecanol. It is shown that the monolithic columns possess fastness configuration and good mechanical intensity via the bonding of 3-(trimethoxysilyl)propyl methacrylate (TMP) to the capillary wall and the polymerization of the crosslinker itself. Compared with a commercial porous layer open tube (PLOT) column and a PEG-20M column, the monolithic columns demonstrate good performance in the analysis of low carbon alcohols in water, the analysis of mixed solvents and the standard liquor sample. In the mixed solvents, the peak symmetries of alcohols, ketones, esters and aromatics precede those on the PLOT column. The separation of methanol, acetaldehyde and ethyl acetate in the standard liquor sample on the monolithic column is much more convenient than that on PEG-20M columns.

Keywords: gas chromatography (GC) monolithic column polydivinylbenzene preparation applications

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