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SYNTHESIS AND CHROMATOGRAPHIC APPLICATION OF PERFLUOROCARBON-MODIFIED SILICA GEL

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Silica gel modified by perfluorocarbon silyl groups is increasingly applied as a stationary phase in high performance liquid chromatography (HPLC). However, the common use is limited by difficulties connected with the synthesis of the perfluorocarbonmethyldichlorosilane necessary for the silica gel surface modification and with the dependence of the chromatographic selectivity on the C-F-content chemically bonded on the silica gel surface.

In this work heptadecafluoro-1.1.2.-H-decylmethyldichloro-H-silane has been synthesized by means of a catalytical reaction under pressure.

The surface modification of silica gel SI 60 is carried out using stoichiometric amounts of the dichlorosilane to achieve the chemical reaction of 10, 20 and 40 % of the reactive silanol groups.

The pure silica gel and its modified products are characterized by measurements of the carbon content, pore size distribution, surface area and the chemical determination of the non-reacted silanol groups of the silica gel taken under reaction.

The chromatographic selectivity investigated by means of polycyclic aromatics and their alkyl derivatives depends systematically on the C-F-content. The 20 %-product shows the most suitable properties for group separation of alkylaromatics. From the pure silica gel to the 40 %-product the retention order of p-Terphenyl and Chrysene is **inverted**. Finally, the reversed phase properties of the modified silica gels synthesized are investigated.