

Polymer-mineral packing materials for RP-HPLC

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Recently hybrid packings have become available stable within wider pH range (up to pH 12) but with retention characteristics identical to classical silica-based packings.

Problems of the silica gel surface modification with polymer layers and the influence of deposited polymer quantity on chromatographic properties of the resulting sorbents have been considered. The surface polymer modification of wide-porous micro-spherical silica (MS) obtained by means of hydro-thermal treatment of meso-porous silica gel under autoclave conditions has been described. The polymer layer itself was formed by octadecylmethacrylate-methylmethacrylate co-polymer (ODMA-BA). As a result efficient packings for reversed-phase high performance liquid chromatography (RP-HPLC) have been obtained.

Tailor-made polymer coatings can serve as an alternative to classical bonded stationary phases. Polymer modification is one of the methods to eliminate disadvantages of the silica packings' (narrow working pH range and "silanol" interactions). Another advantage of polymer modification is the possibility to assert the presence of several functional groups on the surface simultaneously. The number of functional groups may be changed inserting new monomers during co-polymerization process. On the other hand, one can graft different required functional groups to the surface of already coated polymer by means of "grafting polymerization".

ODMA-BA-MA Symmetry 300 hybrid sorbent with polar groups on the polymer phase surface conditioned by the presence of maleic anhydride (MA) in co-polymer has been synthesized.

It has been shown that polymer-containing packing materials for RP-HPLC possess some properties different from that for convenient C₁₈ packing materials. Uracyl may not serve as dead volume marker for columns packed by ODMA-BA and ODMA-BA-MA polymer phases inasmuch definite retention of it takes place by these phases, namely interaction of uracyl molecules with stationary phase surface take place. It is expedient to use butylparabene retention time as dead volume marker for such columns. Chromatographic characteristics of propranolol on columns containing polymer-coated MS also sharply differ from its chromatographic parameters on convenient C₁₈ columns.