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An inorganic boronate affinity in-needle monolithic device for specific capture of cis-diol containing compounds

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Abstract

In this work, inorganic boronate affinity monolith was prepared by in situ synthesis in 0.33 mm i.d. stainless steel needle through sol-gel process using tetraethoxysilane and tetrabutyl orthotitanate as the co-precursors. The morphology, structure and composition of the monolith were characterized. In contrast to conventional boronate affinity materials, inorganic boric acid was used as affinity ligand. Different compounds were used for the evaluation of the boronate affinity of this inorganic monolithic material. The monolith exhibited good selectivity towards cis-diol containing compounds. Recovery of greater than 90% was achieved for in-needle extraction of catechol under neutral conditions. Owing to the hydrophilic property of the monolith, the procedure of affinity chromatography could be performed in aqueous solution. This monolithic in-needle device will be useful for boronate affinity extraction of small-volume samples.

Graphical

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