

The Usage of Effective Sorbents Based on Silica Gel to Selective Removal of Some Metals from Aqueous Media

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Abstract

Industrial effluents raise municipal water pollution and contamination monitoring gains more importance for water sources¹. Separation and/or preconcentration of trace elements are very important prior to their accurate and precise determination. In present study, solid phase extraction procedures were suggested for simultaneous preconcentration of trace levels of Ba(II), Cd(II), Co(II), Cu(II), Ni(II), Pb(II), Sr(II), Cr(III) and Sb(III) on various modified silica gel sorbents. Previously synthesized Schiff bases, N,N'-bis(4-methoxysalicylidene)-1,3-propanediamine (Si-MSPA) and N,N'-bis(4-methoxysalicylidene) ethylenediamine, additionally commercially available fluorescein were used as ligand for modification of silica gel. The characterization of the modified sorbents were achieved using by FT-IR, XRD and SEM monitoring. The modified silica gel was used as sorbent for solid phase extraction of abovementioned metals. Sorption and elution conditions were optimized by central composite design (CCD) or one factor at a time (OFAT) optimization procedures. Investigated SPE procedures were applied on some aqueous samples such as lake, spring, tap, bottled, mineral, snow water.

Keywords: modified silica gel, trace metals, solid phase extraction, aqueous samples