

8th European Chemistry Congress

June 21-23, 2018 | Paris, France

Solid phase extraction using octadecyl bonded silica modified with photosynthetic pigments from *Spinacia oleracea L* for preconcentration of lead (II) ions from aqueous samples

Jolanta Flieger, E Blicharska, M Tatarczak-Michalewska, A Kowalska, A Madejska, A Sroka-Bartnicka, M Szymańska-Chargot, A Plazinska and W Plazinski

Medical University of Lublin, Poland

Extract from *Spinacia oleracea L* was immobilized on octadecyl bonded silica surface to produce the new bio-sorbent for solid phase extraction (SPE). The resultant sorbent was characterized by Fourier Transform Infrared Spectroscopy FT-IR and confocal Raman microscopy to ensure the successful binding of chlorophyll on the surface. The new SPE cartridge has been developed to concentrate trace amount of metal ions from aqueous neutral samples. The measurement of metallic content has been performed by Graphite Furnace Atomic Absorption Spectroscopy (GFAAS). Several analytical parameters affecting the extraction efficiency, such as the pH of sample solution, the volume, sample loading were also investigated. The competitive bio-sorption of divalent cations by using prepared sorbent was studied. The affinity sequence of metal ions to modified column was established as follows: $Pb > Cu > Ni > Zn = Cd = Co$. The maximum sorption capacity of the modified octadecyl bonded silica was $3.09 \mu\text{mol g}^{-1}$, and limit of detection of 2.86 mg L^{-1} was obtained for Pb (II). Recalculating this value into mass of chlorophyll-a immobilized on extraction column, this parameter increases even to 6.26 mmol g^{-1} . The value of lead uptake established in the following work is significantly higher in comparison to reported for other sorbents and biosorbents. It was found that either the biosorption of Pb(II) ions onto modified sorbent or sorption of chlorophyll-a into octadecyl bonded silica gel fitted well to the Toth equation.

j.flieger@umlub.pl