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Original author's style including interpretation, formulas and names of chemical compounds, schemes, pictures and explanations, is preserved in the abstracts published in this book.

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ATOMIC ABSORPTION DETERMINATION OF Cu(II), Cd(II), Zn(II), Pb(II) USING PRECONCENTRATION BY SOLID-PHASE EXTRACTION ON PROPYLTHIOETHYLEAMINE MODIFIED SILICA

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The determination of heavy metals at trace levels is important in the field of environmental analysis. This problem can be solved by the help of highly selective sorbents.

Effective metal ion adsorbent has been prepared by the immobilization of propylthioethyleamine ligand onto the surface of silica gel (SN-SiO_2).The effectiveness of this material to bind metal ions has been attributed to the complexation chemistry between the ligand and the metal. We are investigating properties of propylthioethyleamine grafted on the surface of silica and possibility of application of the obtained surface for preconcentration of heavy metals such as zinc, lead, cadmium, copper, etc. from water solutions.

The capacity factors of SN-SiO_2 for metal ions were determined under a range of different conditions of pH, metal ions concentrations and time of interaction. Preconcentration of Cd^{2+}, Pb^{2+}, Zn^{2+} and Cu^{2+} were used for their preliminary determination by flame atomic absorption spectroscopy. The optimum pH values for quantitative sorption are 5.8, 6.2, 6.5, 7.0 for Pb, Cu, Cd and Zn, respectively. The sorption ability of SN-SiO_2 to metal ions decrease in line: Pb>Cu> >Zn>Cd. The sorption capacity of the sorbent is 2.7, 7.19, 11.12, 28.49 $mg \cdot g^{-1}$ for Cd, Zn, Pb, and Cu, respectively. The sorbent distribution coefficient calculated from sorption isotherms was 10^5 $ml \cdot g^{-1}$ for studied cations. All these metal ions can be desorbed with 5 ml of 0.1$mole \cdot l^{-1}$ HCl (sorbent recovery average out 96-100%).

The results of sorptional properties investigation have shown the possibility of SN-SiO_2 application for Pb^{2+}, Cu^{2+}, Zn^{2+}, Cd^{2+} selective preconcentration. The preconcentrated Cu, Pb, Cd, Zn ions at pH 6-7 were eluted by acid and determined by atomic-absorption method.

The method has been successfully applied to the analysis in drinking water. The results show sufficiently high recoveries.