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DETERMINATION OF PALLADIUM IN VARIOUS SAMPLES BY ATOMIC ABSORPTION SPECTROMETRY AFTER PRECONCENTRATION WITH MODIFIED SILICA

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Propylthioethylamine-modified silica gel (SN-SiO₂) was used as an effective sorbent for the solid phase extraction of palladium (II) ion from aqueous solutions. The effect of some analytical parameters such as pH, concentrations of the analyte and the sample volume on the recovery of palladium was investigated.

Quantitative and selective recovery (>95%) was observed for palladium in the range of pH 1-3. Other co-existing ions (3-d metals) did not influence on the preconcentration and determination of Pd(II). In order to estimate the affinity of palladium (II) ion to SN-SiO₂, its adsorption isotherm was studied. It was found that equilibrium constant and maximal values of Pd(II) sorption for SN-SiO₂ were 0,361 mg⁻¹ and 20,65 mg g⁻¹ respectively.

10% solutions of thiourea could efficiently eluate adsorbed palladium(II) ion from the surface of the adsorbent. An eluate was analyzed by atomic absorption spectrometry. Carried studies showed, that the completeness of Pd(II) sorption from aqueous solutions is maximum (K=40) at a ratio of eluate to sample volume as 5 to 200. The adsorbent is recyclable as its sorption properties didn't change after desorption processes.

On the basis of the research results, the procedure involving pre-concentration of palladium ions and subsequent atomic absorption spectrometry has been proposed. This procedure was tested in the analysis of wastewater and a model solution. The model solution was prepared by acid dissolving of transistors (detection limit 0.05 μg ml⁻¹). The data bear out the sufficient accuracy and reproducibility of the proposed procedure.