

SILICA GELS CHEMICALLY MODIFIED BY TIOUREA AND AMINOTIOUREA GRUPS TO RECOVERY AND MESURING A TRACE AMOUNTS OF MERCURY

The conditions of mercury (II) quantitative removal are investigated and it is established the optimal value of pH for the concentration of trace metals on the silicagels surface, chemically modified by thiourea and aminothiophenol groups. Sorption equilibrium speed setting is from 5 minutes (TUS and TUSOx) to 30 minutes (MPPTS, ABTPS). It is shown the possibility of determination of trace mercury (II) in the form of mixed-ligand complex with Michler's thioketone on the studied sorbents surface by diffuse reflectance spectroscopy methods (DRS) and by colorimetry. It was established that the passage of redox processes in the interaction of mercury (I) with Michler's thioketone leads to changes in sorbent surface color at drying out and storage them of more than one day. As the result of such process there is the imposition of the maxima in DRS formed by the mixed-ligand complexes of mercury (I), that makes it difficult to determine it by this method. Colorimetry, as a rapid method of analysis, contrary allows quantitatively estimate the metal content in the sorbent phases. The dependence of extraction on the concentration of chloride ions in solution was investigated to establish the possibility of mercury (II) removal from natural waters. It was established that leading in of 10^6 -fold amounts of Cl⁻ does not affect the recovery of metal TUS and TUSOx. As follows, above allows offering these sorbents for the concentration of mercury (II) from natural waters of different salt content. The proposed technique of adsorption concentration followed by colorimetric determination of mercury (II) using sulfur sorbent is promising in practice of further laboratory studies.

Key words: mercury, concentration, silica gels