

EFFECT OF SYNTHESIS CONDITIONS ON THE PROTOLYTIC AND ADSORPTION PROPERTIES OF SILICA MODIFIED WITH PROPYLTHIOETHYLEAMINE

Silica chemically modified by propylthioethylamine was synthesized, their protolytic properties and application as an adsorbent for the removal of ions Pd(II) has been investigated. This ligand was grafted to the silica surface with two different routes: (1) as one-step reaction of silanization (homogeneous procedure, $\text{SiO}_2\text{-SN}_{(\text{homo})}$); (2) as multistep chemical modification of silica, using mercaptopropyltriethoxysilane, followed by amino agent to convert the grafted surface SH-group to aminomoiety (heterogeneous procedure, $\text{SiO}_2\text{-SN}_{(\text{het})}$). The new solids were characterized by FTIR and diffuse reflectance UV-Vis spectroscopy. It was shown that a combination of pH-metric and conductometric methods can generally picture of the grafted groups presence in the surface of SiO_2 . The amount of propylthioethylamine groups grafted on the $\text{SiO}_2\text{-SN}_{(\text{homo})}$ and $\text{SiO}_2\text{-SN}_{(\text{het})}$ is found 1.05 mmol/g and 0.61 mmol/g, respectively. In addition these adsorbents are not contained free SH-groups and chemically stable a long period of time. The N,S-containing silica sample prepared by homogeneous procedure had 2 times higher adsorption capacity to ions Pd(II) than the sample by heterogeneous procedure. The results suggest that the prepared $\text{SiO}_2\text{-SN}_{(\text{homo})}$ adsorbent is potentially useful material for high effectively adsorption of metal ions from aqueous solution.

Key words: N,S-containing silicas, conductometric titration, pH-metric titration, adsorption, silver, palladium.