

# Physico-chemical nanomaterials science

## Surface and electrochemical properties of amine-functionalized silica adsorbents with magnetic core

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Functionalized with amine groups silica adsorbents with magnetic core were synthesized on the basis of sol-gel method. The whole procedure is described in paper [1].

In this work, five different silica adsorbents were synthesized and characterized by several analytical techniques: XPS, FT-IR, elemental analysis and acid/base titration. Surface characterization carried out by above-mentioned techniques proved that synthesized materials were characterized by high content of amine functional groups (1.58–2.66 mmol/g), present on the silica surface. Moreover, parameters characterizing electrical double layer (EDL) on the silica adsorbent/electrolyte solution interface, were also measured. Obtained  $\text{pH}_{\text{IEP}}$  (zeta potential measurements) and  $\text{pH}_{\text{PZC}}$  (surface charge density measurements) were different, when compared with those for pure  $\text{Fe}_3\text{O}_4$  nanoparticles, playing role of the magnetic core. Depending on the type of adsorbent, values of  $\text{pH}_{\text{IEP}}$  and  $\text{pH}_{\text{PZC}}$  were different. Obtained values of isoelectric point were in the range of: 6-9; while values of point zero of charge were in the range of 7-9.

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1. *Mel'nik I. V., Zub Y. L., Alonso B., Abramov N. V., Gorbik P. P.* Creation of a functional polysiloxane layer on the surface of magnetic nanoparticles using sol-gel method // *Glass Phys Chem.*-2012.-**38**.-P. 96-104.