

Nanocomposites and nanomaterials

Nanocomposites of polyaniline with modified silica O.I. Aksimentyeva¹, I.B. Olenych¹, B.R. Tsizh^{2,3}, M.R. Dzeryn², Yu.Yu. Horbenko¹

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The introduction of nanoscale fillers into the composites of conducting polymers allows obtaining nanomaterials with high sensitivity of their electrical resistance to the adsorption of various substances. One of the most suitable sensory mediums for detecting gases is polyaniline and its derivatives, including emeraldine chloride [1, 2]. The presence of fillers in the composite structure can lead to stabilization of electrical conductivity as a result of binding excess moisture, that eliminate participating of the water molecules in the processes of protonation of polymer.

In this work the morphology, electrical and moisture absorption properties of the hybrid composites “core-shell” type of polyaniline with nanoparticles of silica modified by titanium (TAC-7) and phosphorus (F-2.1) compounds, obtained by the method of polymerization filling, have been studied. It is shown that the filler content of 1-4% increases the electrical conductivity of composites, and the introduction of modified nanoparticles F-2.1, helps stabilize the resistivity of nanocomposite polyaniline in high humidity.

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2. *Pacher P, Lex A, Eder S, et al.* A novel concept for humidity compensated sub-ppm ammonia detection // *Sensors and Actuators B.*-2010.-**145**, N 1.-P. 181-184.