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Application of ferrocene-resorcinarene in silver nanoparticle synthesis

Sergeeva T., Samigullina A., Gubaidullin A., Nizameev I., Kadirov M., Mukhitova R., Ziganshina A., Konovalov A.

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© 2016 The Royal Society of Chemistry. An amphiphilic resorcinarene with ferrocene groups at the lower rim has been applied as both reductant and stabilizer in the synthesis of colloidal silver nanoparticles. The structure of the nanocomposite obtained was investigated by transmission electron microscopy, atomic force microscopy, X-ray powder diffraction, dynamic light scattering, and UV and IR spectroscopy. In the nanocomposite, the silver nanoparticles are stabilized by the multi-layers formed by ferrocene-resorcinarene. The diameter of the nanoparticles is 20-30 nm while the size of the nanocomposite is about 45 nm. The nanoparticles demonstrate good catalytic activity for p-nitrophenol reduction. 40 nanomoles of the silver nanoparticles is sufficient to complete the reduction of p-nitrophenol over ten minutes.

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