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Colloidal stability and photophysical characteristics of luminescent silica nanoparticles modified with various nitrogen/oxygen-containing trialkoxysilanes

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Abstract

© 2016, Pleiades Publishing, Ltd. Surface modification of the luminescent silica nanoparticles doped with Tb(III)-p-sulfonatothiacalix[4]arene complex was carried out using a series of nitrogen/oxygen-containing trialkoxysilanes. It was found that groups capable of nonspecific interactions on the surface of the nanoparticles cause a significant decrease in their colloidal stability. The chromophore moieties in the modifiers were found to quench the luminescence of the nanoparticles. The surface modification of the nanoparticles is responsible for the change in the mechanism of luminescence quenching in the presence of copper(II) ions due to decreased accessibility of luminophores to the quencher.

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Keywords

azides, click reaction, luminescence, luminescence quenching, silica nanoparticles, trialkoxysilanes