

Journal of Physical Chemistry C 2010 vol.114 N14, pages 6350-6355

Dual visible and near-infrared luminescent silica nanoparticles. Synthesis and aggregation stability

Fedorenko S., Bochkova O., Mustafina A., Burilov V., Kadirov M., Holin C., Nizameev I., Skripacheva V., Menshikova A., Antipin I., Konovalov A.

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

Abstract

Novel silica nanoparticles exhibiting near-infrared (NIR) and dual NIR-visible emission were synthesized according to reverse microemulsion procedure through the encapsulation of Yb(III) complex with p- sulfonatothiocalix[4]arene (Yb) and [Ru(dipy)3]Cl2 (Ru) as NIR- and visible-emitting luminophores into silica matrix. The synthesis was carried out at various Yb:Ru molar ratio. The numbers of Ru and Yb complexes per one nanoparticle were calculated from both fluorimetric and inductively coupled plasma atomic emission spectroscopy data. The dynamic light scattering measurements of aqueous dispersions of Yb, Ru, and Ru-Yb nanoparticles elucidate the relationship between the complexes inserted into nanoparticles and their aqueous dispersity. The transmission electron microscopy images were used to measure the size of the nanoparticles. The atomic force microscopy images reveal the different aggregation morphology of Yb- and Ru-doped nanoparticles. © 2010 American Chemical Society.

<http://dx.doi.org/10.1021/jp912225u>
