ONE-STEP SYNTHESIS AND CHARACTERIZATION OF FLUORESCENT NANOPARTICLES WITH CHEMICALLY REACTIVE SURFACE

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Colloidal silica exhibit many desirable characteristics such as low cytotoxicity, simple preparation, and control over interparticle interactions, among other. The surface modification extends the range of potential applications, since it is possible to choose an appropriate functionalization to disperse them in the physical medium of interest. In addition, with the incorporation of a fluorescent-probe covalently linked an easily detectable product is obtained. There are numerous reported methods for obtaining fluorescent nanoparticles (NP) with reactive surface; nevertheless, all of them involves at least two steps: the synthesis of the NP and then the functionalization of the surface.

In this work, through the originally developed method, it was possible the incorporation, by covalent linkage, of two functions: the fluorescent molecules (FITC), predominantly in the inner of the particles, and aminopropyl groups on their surface. Combining the results obtained by Scanning Electron Microscopy (SEM), Small Angle X-ray Scattering (SAXS), Diffuse Reflectance Infrared Fourier Transform Spectroscopy (DRIFTS) and Fluorescence Spectroscopy, it is possible to shown that this kind of NP is achievable, with less than 100 nm diameter, through only one-step synthesis by selective co-condensation of all reactants. Furthermore, an increase of fluorescence lifetime of the probe was observed after encapsulation.

Keywords: silica nanoparticles, fluorescence probe, co-condensation

References:

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