Sonochemical synthesis of fluorescent dye-encapsulated silica nanoparticles

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The identification and characterization of interaction between cells and protein-receptors are essential for biosensor applications. Recently, optical analysis using organic-based fluorescence dyes has been used in bioanalysis applications for several years. However, the problems are in the stability and typical high toxicity of these dyes. Incorporation of fluorescence dyes in silica matrix seems to be one of the most promising approaches due to the great optical and mechanical properties of silica. Therefore, further development of these dye-encapsulated silica nanoparticles is expected to provide a variety of advanced tools for molecular biology, genomics, and diagnosis and therapy of infection. In this study, we synthesized the fluorescence dye-encapsulated silica nanoparticles by sonochemical method. The dye-encapsulated silica nanoparticles are characterized and analyzed with SEM, XRD, and other tools. Additionally, we will discuss about the possibility of these dye-doped silica particles for bioanalysis applications.