

Synthesis of gold-deposited fluorescent silica nanoparticles for biosensor application

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Gold and silica nanoparticles have been noted in bioanalysis applications recently due to high surface area, high chemical and mechanical stability and high biocompatibility. Most synthesis and deposition methods of gold nanoparticles on silica particles reported previously required extra steps to modify silica particles. Besides synthesized gold nanoparticles have wide size and shape distributions. We used a sonochemical method to provide a unique condition for the fabrication of gold nanoparticles and modification of silica nanoparticles.

In this study, the fluorescent silica nanoparticles with uniform size and shape were synthesized using water-in-oil (W/O) microemulsion method and gold nanoparticles were deposited on the surface of silica under intensive ultrasound irradiation. The diameter of produced fluorescent silica nanoparticles is in the range of 58-60nm. For the application in biosensor, gold-doped red fluorescent silica nanoparticles as a biosensor was demonstrated through the attachment of gold binding polypeptide-avian influenza viral surface antigen (GBP-AIa) and the subsequent interaction with anti-avian antibody.