

## Sonochemical Production of Nanoparticles and Its Applications

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Nanoparticles coated on a silica provide a high surface area and possess chemical and physical properties that are different from those of the bulk phase. They have the potential for application in optics, optoelectronics, chemical engineering, biology, and so forth. Oldenburg and co-workers reported on a colloid reduction chemical route for the formation of solid-core/gold nanoshell particles. However, complex process control and special conditions are required for generating these particles.

Sonochemistry is an alternative technique that can synthesize coated material. In this thesis, silica particles and gold nanoparticles are produced within the ultrasonic field. The gold nanoparticles doped silica particles were synthesized by the sonochemical method. The silica core/gold nanoshell particles produced were applied in the detection of biological molecules. The gold coated silica particles with a high surface area were studied for the attachment and detection of the biomolecules such as goat and rabbit antibody and antigen.