

The Facile Synthesis of Monodisperse Ag/SiO₂ Core-Shell Composite

The versatile application of monodisperse Ag/SiO₂ core-shell composites in disciplines including biosensing, photonic devices, and catalysis make their fabrication important. The controlled synthesis of these composites was developed employing TEOS precursor, ammonium hydroxide catalyst, and APTES as an amine functionalization reagent. Homogeneous silver nanoparticles as a composite core generated by microwave radiation contribute to the creation of a uniform Ag/SiO₂ core-shell composite. The composite solution was pale yellow in color and exhibited a distinct peak at 434 nm. TEM revealed a monodisperse spherical nanocomposite with core-shell structure. XRD results confirmed that the composite core of the Ag crystals had a fcc structure. The FTIR spectra of the composite indicate the success of silica coating and NH₂ group functionalization. As a result, this approach can be utilized to create monodisperse, homogeneous, and stable nanocomposites.

Keywords : synthesis, monodisperse, Ag/SiO₂ core-shell, composites

Primary author: Dr ISMILLAYLI, Nurul (Universitas Mataram)

Co-authors: Prof. JALIL, Aishah Abdul (Universiti Teknologi Malaysia); Prof. PRASETYOKO, Didik (Institut Teknologi Sepuluh Nopember); Dr SUPRAPTO, Suprpto (Institut Teknologi Sepuluh Nopember)

Presenter: Dr ISMILLAYLI, Nurul (Universitas Mataram)

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