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Chemical syntheses of functional nanostructures and their SERS applications

Monday 28 November 2016 13:00 (20 minutes)

Nanomaterials is well-known for their versatile applications in electronics, medicals, chemicals, catalysts as well as environments. By tuning their size, shape, morphology, and composition, one could systematically change their chemical, physical, electrical, mechanical, and catalytic properties. In this contribution, we chemically synthesized complex gold and silver nanostructure (nanospheres, nanoplates, nanoporous, and nanostars) using hydrogen peroxide (HP) as the reducing and shape-controlling agents. The strong etchant of HP and surface passivation of chloride ion promote the dissolution of certain facets while preserving and promoting growth of other facets enables the formation of complex nanostructures. By systematically tuned the nucleation and growth environment, we could selectively fabricate desired nanostructure. We then later explore their nano-size effects and surface enhance capabilities for trace chemical analysis using surface enhanced Raman scattering (SERS), tip enhanced Raman scattering (TERS) as well as light harvesting potential using organic solar cell (OSC).

Keywords: nanostructures, SERS, TERS, selective etching, hydrogen peroxide

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