

Abstract Submitted
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Monitoring Gold Nanorod Synthesis based on their Localized Surface Plasmon Resonance¹ AMNEET GULATI, Department of Physics and Astronomy, Rice University, HONGWEI LIAO, Department of Chemistry, Rice University, JASON HAFNER, Department of Physics and Astronomy, and Chemistry, Rice University — The extinction spectra of structurally anisotropic gold nanoparticles exhibit surface plasmon resonances that may be tuned through the visible and near-infrared portions of the electromagnetic spectrum by controlling their geometry. Gold nanorods, whose longitudinal extinction peak is proportional to their aspect ratio, are synthesized by reduction of gold chloride onto gold seed nanoparticles. While growth anisotropy is known to be induced by a surfactant (cetyltrimethylammonium bromide), the detailed growth mechanism is poorly understood. Here, we study the growth kinetics of nanorods by continually monitoring their extinction spectra during synthesis. The spectra are analyzed by Rayleigh-Gans theory to determine the instantaneous length and diameter of the growing nanorods. This data yields microscopic growth rates which provide insight into the mechanism of nanorod synthesis.

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