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Seed-Mediated synthesis and application of Gold nanorods in Organic Solar Cells

The properties of noble metals are different when these materials are reduced to nano-scale dimensions (1 – 100 nm), dependent on shape and size of the particle. In this research gold nanorods were synthesized using the mediated-seed method. The absorption spectrum of these nanorods showed two bands; the transverse and longitudinal band. Transmission Electron Microscopy (TEM) images show nanorods with lengths that ranged from 10 to 12 nm, widths from 3.5 to 4.0 nm, and an aspect ratio of 2.9. X-ray diffractometer (XRD) confirmed the crystal nature of the nanorods with an fcc structure and average crystallite size of 1.32 nm. It was also noted that the predominant growth of the nanorods was in the direction of the (111) plane. The Raman peaks of the nanorods were more intense at the wavenumbers 452, 752, 937, 939, 1062, and 1128 cm⁻¹. The ability to absorb light in two regions; absorption efficiency dominance over scattering efficiency, and near field enhancement from incident photon confinement makes gold nanorods attractive agents for applications in organic solar cells.

Keywords: Gold nanorods, plasmonic effect, surface plasmon

Apply to be considered for a student ; award (Yes / No)?

Yes

Level for award;(Hons, MSc, PhD, N/A)?

MSc

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