Comparison of third-order nonlinear optical properties of colloidal gold nanoshells and nanorods.

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Streszczenie

A detailed comparison of third-order nonlinear optical properties of colloidal gold nanoshells (NSs) and gold nanorods (NRs) in water solutions has been carried out with the open- and closed-aperture Z-scan measurements, performed with femtosecond laser pulses over a broad range of wavelengths. Absorption saturation was found to be a dominant effect for all the studied nanoparticles, however two-photon absorption properties are also detected, especially at the shortest wavelengths studied. The value of the merit factor σ_2/M (two-photon absorption cross section scaled by the molecular weight) for the NRs (10nm × 35 nm) at 530 nm is 7.5 (GM·mol/g), while for the NSs is 1.9 (GM·mol/g) at the same wavelength.

Słowa kluczowe

Gold nanorods, gold nanoshells, Z-scan technique, nonlinear, optical properties

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