

Properties of Er₂O₃ nanoparticles synthesized by a modified co-precipitation method

Castañeda-Contreras, J.; Marañon-Ruiz, V. F.; Meneses-Nava, M. A.; H. Perez- Ladrón de Guevara R.A.; Rodríguez Rojas R.; Chiu-Zarate.

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Abstract

Er₂O₃ nanoparticles were synthesized by co-precipitation with the addition of ascorbate as stabilizing agent. The nanoparticles had spherical shapes with a mean diameter of 32 nm and were allocated in clusters, as determined by XRD, AFM, and optical microscopy. Characteristic green and red emissions from Er³⁺ were recorded by pumping the nanoparticles at 525 nm, 805 nm, and 975 nm. However, the luminescence spectra show an enhancement of red emission for NIR pump wavelengths. We proposed this behavior was due to phonon-assisted depopulation mechanisms and energy transfer processes related to the different excitation schemes.