

Abstract Submitted
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Fabrication and Optical Intensity Analysis of Nd³⁺:Y₂O₃ nanoparticles embedded in PMMA¹ SREERENJINI CHANDRA, JOHN B. GRUBER, DHIRAJ K. SARDAR, University of Texas at San Antonio — The fabrication, structural morphology, and optical characterization of Nd³⁺:Y₂O₃ ions doped in the plastic, Polymethyl Methacrylate (PMMA) will be discussed. The Judd-Ofelt intensity parameters obtained by analyzing the room temperature absorption spectrum of the sample are used to determine the radiative decay rates and branching ratios of different transitions from the upper manifold to the lower lying manifolds. Using the radiative decay rate values, radiative lifetimes of the excited states have been determined. We report the low-temperature absorption spectra of Nd³⁺:Y₂O₃/PMMA nanocomposites. A modeling analysis based on the Monte-Carlo method was used to determine the atomic and crystal-field parameters corresponding to the best (global) minimum between theoretical eigenvalues and experimental Stark sublevels. The room temperature fluorescence lifetimes were measured for intermanifold emission transitions. The detailed study reveals the potential of Nd³⁺:Y₂O₃/ PMMA nanocomposites as an efficient laser host.

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