Spectroscopic studies and dynamics of Nd^{3+} ions in RbY_2Cl_7 single crystals. Part I. Analysis of site-selective excitation and emission spectra.

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Streszczenie

Single crystals of Nd^{3+}:RbY_2Cl_7 were grown by the Bridgman–Stockbarger method. The host crystal contains two slightly inequivalent Y^{3+} ions, each with an approximate C_{2v} site symmetry. The crystal-field energy levels of the Nd^{3+} ion doped in the two slightly inequivalent sites of the host crystal have been measured by optical absorption spectroscopy as well as by laser-selective excitation and emission experiments. As many as 151 and 156 energy levels have been ascribed to the Nd(1) and Nd(2) sites, respectively. Emission transients of a number of the levels were determined. Strong fluorescence and upconversion transitions were recorded and some mechanisms involving excited state absorption and energy transfer between Nd^{3+} ions were proposed as explanatory for the results of the present investigations.

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