

Synthesis, structure and radiative and nonradiative properties of a new Dy³⁺ complex with sulfonylamidophosphate ligand.

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In recent years there has been growing interest in lanthanide-based multifunctional materials that exhibit interesting photophysical properties. This work presents spectroscopic and crystallographic characterization of a new dysprosium complex with sulfonylamidophosphate ligand. The crystal structure of [NaDy(SP)₄]₂·i-PrOH was determined and refined. It turns out that the Dy(III) complex is not isostructural with earlier reported compounds and crystallizes in the monoclinic system (space group *P*2₁). Two crystallographically independent dysprosium atoms are in eight-fold coordination, with a triangular dodecahedron geometry. Absorption, emission (77 and 300 K) and excitation spectra as well as fluorescence decay time measurements allowed optical characterization of obtained complex. Efficient energy transfer from SP⁻ ligand to Dy³⁺ ion has been demonstrated. The Judd-Ofelt theory was applied to predict fundamental fluorescence properties of Dy³⁺ ion in the title chelate. The Judd-Ofelt intensity parameters were used to determine the emission transition probabilities, fluorescence branching ratios and radiative lifetime of the emitting ⁴F_{9/2} level. The obtained results indicate that the investigated chelate can be a potential candidate for OLEDs emitting yellow light.

Słowa kluczowe

DY³⁺, sulphonylamidophosphates, crystal structure, Absorption and emission spectra, Judd-Ofelt intensity calculations, energy transfer

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