



Optical properties of Sm³⁺-doped Y₂Te₄O₁₁.

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Streszczenie

Spectroscopic properties of Sm³⁺-doped Y₂Te₄O₁₁ micro-crystals were studied in the 6000–18,500 cm⁻¹ spectral range. Vibrational, electronic absorption, fluorescence and excitation spectra as well as fluorescence dynamics of the Sm³⁺-doped title micro-crystals are presented and analyzed in detail. A Judd–Ofelt intensity analysis of the absorption spectrum at 300 K has been applied for determination of Ω_λ parameters which in turn have been used for calculations of the radiative transition probability factor (A), the fluorescence branching ratios (β), the natural (radiative) lifetime of the ⁴G(4)_{5/2} level of Sm³⁺ and the emission cross-section (σ_{em}). An analysis of the non-radiative decay was based on the cross-relaxation mechanisms. The achieved results indicate that the investigated samples are potentially applicable as a 605 and 652 nm laser host as well as an orange phosphor.

Słowa kluczowe

Sm³⁺ ion, tellurate, phosphor, Laser materials, Cross-relaxation

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