Optical spectroscopy of U^{3+} doped KPb_2Cl_5 laser crystal.

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Streszczenie

Non hygroscopic U3+:KPb2Cl5 single crystals with a 0.1 mol% U3+ nominal concentration and good optical quality have been obtained by the Bridgman–Stockbarger method. High-resolution absorption and emission spectra of the crystals were recorded at room
temperature in the 4000–25000 cm1 and 4000–14000 cm1 spectral ranges, respectively. Excitation in the spectral region of 5f3 !5f26d1
transitions produced a strong near infrared emission from the 4F3/2 and 4I11/2 energy levels. A Judd–Ofelt intensity analysis has been
performed in order to describe the electric dipole strengths of the observed transitions. The obtained phenomenological parameters were used to predict luminescence properties of U3+ ions doped in the KPb2Cl5 single crystal.

Słowa kluczowe

Uranium(3+) laser ion, KPb2Cl5 host crystal, Judd–Ofelt intensity analysis, Absorption spectra, Emission spectra

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