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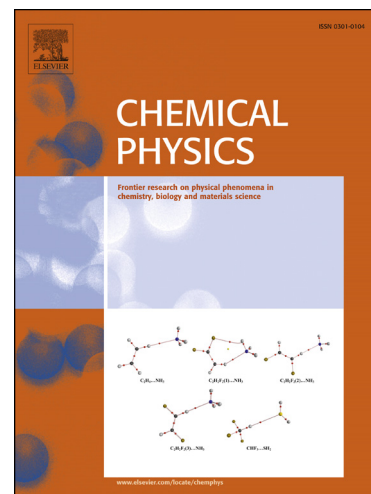
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# Spectroscopic properties of $\text{ErAl}_3(\text{BO}_3)_4$ single crystal

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## Abstract

Single crystal of  $\text{ErAl}_3(\text{BO}_3)_4$  was grown and its structure was studied. Polarized absorption spectra of  $\text{ErAl}_3(\text{BO}_3)_4$  single crystal were measured in the spectral range 1670-330 nm (6000-30000  $\text{cm}^{-1}$ ). The Judd-Ofelt spectroscopic parameters have been determined:  $\Omega_2=4.87 \cdot 10^{-20} \text{ cm}^2$ ,  $\Omega_4=2.49 \cdot 10^{-20} \text{ cm}^2$ ,  $\Omega_6=2.72 \cdot 10^{-20} \text{ cm}^2$ . These parameters have been used to calculate the radiative transition probabilities, the multiplet luminescence branching ratios and the fluorescence life times of the manifolds. The luminescence spectra due to transitions  $^2H_{11/2} \rightarrow ^4I_{15/2}$  (526 nm),  $^4S_{3/2} \rightarrow ^4I_{15/2}$  (548 nm),  $^4F_{9/2} \rightarrow ^4I_{15/2}$  (662 nm),  $^2H_{11/2} \rightarrow ^4I_{13/2} + ^4I_{9/2} \rightarrow ^4I_{15/2}$  (800 nm) and  $^4S_{3/2} \rightarrow ^4I_{13/2}$  (855 nm) were recorded in  $\alpha$ ,  $\sigma$  and  $\pi$  polarizations. The most intensive luminescence belonged to  $^4S_{3/2} \rightarrow ^4I_{15/2}$  transition (548 nm).

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Keywords: rare earth compounds;  $\text{Er}^{3+}$ ; spectroscopic properties; Judd-Ofelt analysis; luminescence.

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