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Holmium iron borate: High-resolution spectroscopy and crystal-field parameters

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Abstract

© The Authors, published by EDP Sciences. High-resolution transmission spectra of $\text{HoFe}_3(\text{BO}_3)_4$ single crystals were measured in broad spectral (5000-23000 cm^{-1}) and temperature (1.7-300 K) ranges. Crystal-field energies of the Ho^{3+} ions were determined for a paramagnetic and easy-axis antiferromagnetic phases of the compound. On the basis of these data and of preliminary crystal-field calculations in the frame of the exchange-charge model, crystal-field parameters were found. A parameter of the isotropic Ho-Fe exchange interaction was estimated.

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