

Investigations of the EPR Parameters and Defect Structures of Two Types of Trigonal Cr^{3+} Centers in CsMgCl_3 , CsMgBr_3 and CsCdBr_3 Crystals

Lv He^a, Xiao-Xuan Wu^{a,b,c}, Wen-Chen Zheng^{a,c}, and Yang Mei^a

^a Department of Material Science, Sichuan University, Chengdu 610064, People's Republic of China

^b Department of Physics, Civil Aviation Flying Institute of China, Guanghan 618307, People's Republic of China

^c International Centre for Materials Physics, Chinese Academy of Sciences, Shenyang 110016, People's Republic of China

Reprint requests to Prof. W.-C.Z.; Fax: +86-28-85416050; E-mail: zhengwc1@163.com

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The EPR g factors g_{\parallel} , g_{\perp} and zero-field splitting D of trigonal $\text{Cr}^{3+}\text{-M}^+$ ($\text{M}^+ = \text{Li}^+, \text{Cu}^+, \text{Na}^+$) and $\text{Cr}^{3+}\text{-V}_\text{B}\text{-M}^{3+}$ ($\text{M}^{3+} = \text{Cr}^{3+}, \text{In}^{3+}, \text{Sc}^{3+}, \text{Y}^{3+}, \text{Lu}^{3+}$; V_B denotes the B^{2+} vacancy) centers in some CsBX_3 ($\text{B} = \text{Mg}, \text{Cd}$; $\text{X} = \text{Cl}, \text{Br}$) crystals are calculated from high-order perturbation formulas based on the two-spin-orbit coupling parameter model of the 3d^3 ion in trigonal symmetry. From the calculations, these EPR parameters are reasonably explained and the local lattice distortions caused by the charge compensators M^+ or V_B are estimated. The results are discussed.

Key words: Electron Paramagnetic Resonance; Crystal- and Ligand-field Theory; Defect Structure; Cr^{3+} ; CsMgCl_3 ; CsMgBr_3 ; CsCdBr_3 .