

Studies of the Angular Distortion around Ti^{3+} on the Trigonal (2a) Al^{3+} Site of $\text{LaMgAl}_{11}\text{O}_{19}$

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The angular distortion around the impurity Ti^{3+} on the trigonal (2a) Al^{3+} site of $\text{LaMgAl}_{11}\text{O}_{19}$ is theoretically studied from the perturbation formulas of the anisotropic g factors, g_{\parallel} and g_{\perp} , for a $3d^1$ ion in trigonally distorted octahedra. Based on the studies, the metal-ligand bonding angle is found to increase from θ_{H} in the host (2a) Al^{3+} site to θ in the impurity center by about 2° , due to the local tightness around the larger Ti^{3+} replacing the smaller Al^{3+} . The theoretical results based on the above angular distortion are in reasonable agreement with the observed values.

Key words: Defect Structure; Gyromagnetic Factors; Crystal- and Ligand-Field Theory; Ti^{3+} ; $\text{LaMgAl}_{11}\text{O}_{19}$.