EPR Study of VO^{2+} Doped Diammonium Tricadmium Tetrakis (Sulfate) Pentahydrate $[(NH_4)_2Cd_3(SO_4)_4 \cdot 5H_2O]$ Single Crystals

İbrahim Kartal, Bünyamin Karabulut, and Esat Bozkurt

Ondokuz Mayıs University, Science and Art Faculty, Physics Department, 55139, Samsun, Turkey

Reprint requests to İ. K.; E-mail: ikartal@omu.edu.tr

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Electron paramagnetic resonance (EPR) studies are carried out on vanadyl (VO^{2+}) ions in diammonium tricadmium tetrakis (sulfate) pentahydrate single crystals at room temperature. The EPR spectra of a single crystal exhibit resonance signals characteristic to VO^{2+} ions. The analysis of EPR spectra indicates that the VO^{2+} ions in single crystals show two magnetically inequivalent VO^{2+} sites in distinct orientations occupying substitutional positions in the lattice and showing very high angular dependence. They form in octahedral coordination with tetragonal compression with C_{4v} symmetry. The spin Hamiltonian parameters are determined, and these parameters have been used to estimate the bonding coefficients of the VO^{2+} ion in a diammonium tricadmium tetrakis (sulfate) pentahydrate lattice. The parallel and perpendicular components of axially symmetric **g** and hyperfine (**A**) tensors are evaluated and the results are discussed and compared with previous reports.

Key words: EPR; ESR; Vanadyl Ion; Single Crystal.