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.