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Magnetic Field Effect on the dielectric properties of the Single Molecule Magnet V_{15} RELJA VASIC, National High Magnetic Field laboratory, NARPINDER KAUR, Florida State University, JAMES BROOKS, National High Magnetic Field Laboratory, NARESH DALAL, Florida State University — Single-molecule hysteresis and quantum tunneling of magnetization (QTM) have made single molecule magnets(SMMs) among the most widely studied compounds in the past decade. Best known SMMs are Mn_{12}-acetate and Fe_8Br_8. Recently a polyoxovanadate compound $K_6[V_{15}As_6O_{42}(H_2O)].8H_2O$, henceforth V_{15}, has been shown to exhibit some of the properties of SMMs despite an S=1/2 ground state, and no evident potential energy barrier to the reorientation of the magnetic moment. In this study we have investigated magnetic field effects on the dielectric properties of V_{15} using ac impedance technique. In preliminary experiments over the frequency range of 1-100kHz and temperature range of 10-300K, V_{15} is found to exhibit three independent relaxation mechanisms. On the application of magnetic field, the dielectric relaxation peaks shift towards higher temperatures. The presentation will discuss details of sample preparation, measurement techniques and theoretical interpretation of this newly observed effect.

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