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Mn-55 NMR Relaxation and Full Angular Dependence of Mn12-Bromoacetate ANDREW HARTER, FSU / NHMFL, NICOLE CHAKOV, UF, BRIAN ROBERTS, FSU, RANDY ACHEY, FSU / NHMFL, ARNEIL REYES, NHMFL, PHIL KUHNS, NHMFL, GEORGE CHRISTOU, UF, NARESH DALAL, FSU / NHMFL — The phenomenon of quantum tunneling of magnetization (QTM) observed first in Mn12-acetate has attracted considerable attention lately, but its origin is still not fully clear. One important question is the role of lattice-solvated molecules and the consequent lowering of local site symmetry from axial to non-axial. We have developed single crystal NMR techniques to probe this question more deeply. In particular, we have carried out Mn-55 measurements on single crystals of Mn12-acetate and its bromoacetate variant. Spin-lattice measurements down to around 300mK have been studied in zero field while a complete angular dependence study was undertaken at 2K and 1.75T. Angle variation studies clearly show that the local symmetry around the Mn(4+) nuclei is non-axial. Details of the NMR technique, the important role of sample preparation (single crystal vs oriented powder) and the relationship of the data to the QTM mechanism will be discussed.

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