## Abstract Submitted for the MAR13 Meeting of The American Physical Society

Investigation of Proton Dynamics in a (CH<sub>3</sub>)<sub>4</sub>NCdCl<sub>3</sub> Single Crystal by using <sup>1</sup>H Nuclear Magnetic Resonance Measurements MOOHEE LEE, JUNG SEOK SIM, KIHYEOK KANG, HO HYOUN KIM, Department of Physics, Konkuk University, Seoul 143-701, South Korea, AE RAN KIM, Department of Science Education, Jeonju University, Jeonju 560-759, South Korea —  $(CH_3)_4NCdCl_3(TMCC)$  is reported to exhibit two first-order structural phase transitions. The crystal has a hexagonal structure in phase I at room temperature and then changes to a monoclinic one in phase II below 118 K. Finally a ferro-elastic monoclinic phase III appears below 104 K. The a- and c-axes of TMMC were found by using X-ray diffraction at room temperature. <sup>1</sup>H NMR measurements of spectrum, spin-lattice relaxation time  $T_1$  and rotating-frame relaxation time  $T_{1 \, o}$ were performed at 4.8 T parallel or perpendicular to the c-axis from 300 K down to 65 K. The spectrum shows no significant changes at both transition temperatures.  $T_1$  and  $T_{1\rho}$  monotonically decrease at low temperature and then show an abrupt decrease around 110 K. As the temperature decreases further,  $T_1$  shows a minimum at 100 K and becomes longer whereas  $T_{1\rho}$  continuously decreases. From these data, the proton dynamical behavior is analyzed and identified.

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