

^1H NMR Study on the Motion of NH_4^+ in Ferroelectric

$\text{NH}_4\text{H}(\text{ClH}_2\text{CCOO})_2$ and Mixed $(\text{NH}_4)_{1-x}\text{Rb}_x\text{H}(\text{ClH}_2\text{CCOO})_2$ ($x = 0.15$)

M. Zdanowska-Frączek, A. Kozak^a, R. Jakubas^b, J. Wąsicki^a, and R. Utrecht^a

Institute of Molecular Physics, Polish Academy of Sciences,
60-194 Poznań, Smoluchowskiego 17, Poland

^a Faculty of Physics, A.Mickiewicz University, 61-614 Poznań, Umultowska 85, Poland

^b Faculty of Chemistry, Wrocław University, 50-385 Wrocław, Joliot-Curie 14, Poland

Reprint requests to Dr. M. Z.-F.; Fax: (61) 86-84-524; E-mail: mzf.ifmpan.poznan.pl

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Temperature-dependent proton NMR relaxation time measurements have been performed at 60 MHz in order to study the NH_4^+ dynamics in ferroelectric $\text{NH}_4\text{H}(\text{ClH}_2\text{CCOO})_2$ and mixed $\text{Rb}_x(\text{NH}_4)_{1-x}(\text{ClH}_2\text{CCOO})_2$, where $x = 0.15$. The data indicate that the dominant relaxation mechanism for the NMR spin-lattice relaxation time T_1 in both crystals involves simultaneous NH_4 group reorientation about their C_2 and C_3 symmetry axis in the paraelectric phase. Details of the NH_4^+ reorientation have been inferred from analysis of temperature dependence of T_1 assuming the Watton model. The activation parameters of the motions have been determined. It has been found that the substitution of Rb does not change the activation parameters of the NH_4 group dynamics.

Key words: Ferroelectrics; Phase Transition; NMR.