^{35}Cl NQR Study of Phase Soliton Formation and Residual Commensurations in K_2ZnCl_4

Dong Keun Oh, Cheol Eui Lee, and S. Y. Jeong[a]

Department of Physics, Korea University, Seoul 136-701, Korea
[a] Department of Physics, Pusan National University, Pusan 609-735, Korea

Reprint requests to C. E. L.; E-mail: rscel@korea.ac.kr

Z. Naturforsch. **57 a,** 363–368 (2002); received April 9, 2002

Presented at the XVIth International Symposium on Nuclear Quadrupole Interactions, Hiroshima, Japan, September 9-14, 2001.

In order to investigate the dynamics of the $ZnCl_4$ tetrahedra in K_2ZnCl_4, ^{35}Cl nuclear quadrupole resonance was employed for the spin-lattice relaxation measurements of each of the triplicated Cl sites in the lock-in phase. The temperature dependence of the spin-lattice relaxation rate ($1/T_{1Q}$) indicates that the domain peak observed in the incommensurate phase arises from the $ZnCl_4$ tetrahedral site with a negligible reorientational motion. On the other hand, an activated reorientational motion of the other two $ZnCl_4$ tetrahedral sites appears to lead to the phase solitons. Molecular motions in Rb_2ZnCl_4 and in Cs_2ZnCl_4, undergoing an incommensurate an not incommensurate phase transition, respectively, were also compared.

Key words: K_2ZnCl_4; ^{35}Cl NQR; Phase Soliton Formation; Residual Commensurations.