

Incommensurability and Domain Structure of K_2SbF_5

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Phase transitions and incommensurability in K_2SbF_5 have been studied by means of ^{123}Sb NQR spectra and spin-lattice relaxation measurements. The phase transitions occur at 117, 135 and 260 K. The line shape and temperature dependence of the spin-lattice relaxation time T_1 at 135 to 260 K are characteristic for an incommensurate state with a plane wave modulation regime. At 117 to 135 K a distinct fine structure of the NQR spectra has been observed. The X-ray diffraction pattern of this phase is interpreted as a coexistence of two modulation waves along the a and b axis with wave vectors $(a^*/6 + b^*/6)$ and $(a^*/2 + b^*/2)$, respectively. The best interpretation that fits our NQR data is a coexistence of two domains, the structures of which are modulated with different periods in such a manner that each domain exhibits only one of the aforementioned modulation waves. Redistribution of line intensities with the variation of temperature shows that one of the domains becomes energetically preferable on cooling and is transformed into the low temperature phase at 117 K. The ^{123}Sb NQR measurements in K_2SbF_5 show unusually short values of T_1 , which become close to the spin-spin relaxation time T_2 with increasing temperature. – Pacs: 61.44.Fw, 64.60, 64.70, 64.70.Rh, 76.60

Key words: NQR; Incommensurate Phases; Phase Transitions; Domain Structure.