Structure, phase transitions and molecular motions in ferroelastic $(C_4H_8NH_2)SbCl_6 \cdot (C_4H_8NH_2)Cl$.

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Streszczenie

The crystal structure at 293 K of the new pyrrolidinium chloroantimonate (V) analogue, $(C_4H_8NH_2)SbCl_6 \cdot (C_4H_8NH_2)Cl$, has been determined by x-ray diffraction as monoclinic, space group $P2_1/c$, Z = 8. The crystal is built up of isolated $SbCl_6^-$ anions, two types of inequivalent pyrrolidinium cation and isolated Cl^- ions. It undergoes five solid-solid phase transitions: at 351/374 K of first-order type (cooling/heating, respectively), at 356 and 152 K second order and at 135/141 and 105/134 K first order, detected by differential scanning calorimetry, dilatometric and dielectric measurements. The ferroelastic domain structure appears between 152 and 135 K. The proton nuclear magnetic resonance second moment and spin-lattice relaxation time of polycrystalline samples were studied over the temperature range 27-410 K. The order-disorder mechanism of the phase transitions at 105 and 374 K connected with the reorientational motion of the pyrrolidinium cations has been confirmed.

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