## Phase Transition of $C_2H_5NH_2CH_2CH_2NH_3$ Zr $[N(CH_2COO)_3]_2$ ·4 H<sub>2</sub>O

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In the course of our investigations on zirconium-nitrilotriacetates of alkyldiamines we found in the title compound, 2-ethylammoniumethylammonium-zirconium bis(nitrilotriacetato)-tetrahydrate, anomalous thermal and elastic properties between 288 und 293 K. Above 293 K, this species exhibits space group P2<sub>1</sub>/n with lattice parameters  $a_1 = 10.534(2), a_2 = 11.683(2), a_3 = 20.407(4)\text{\AA}, \alpha_2 = 93.33(3)^\circ$ . When lowering the temperature from 293 K, a strong attenuation of certain ultrasonic resonances occurs reaching a maximum at 288.4 K. Below this temperature the attenuation of ultrasonic waves, in which the elastic constants c<sub>11</sub>, c<sub>22</sub>, c<sub>12</sub> and c<sub>66</sub> are involved, is drastically reduced. If the low temperature phase is heated to room temperature, the attenuation reaches a maximum at 291.5 K indicating a hysteresis. This hysteresis is confirmed in DSC measurements, where a transition enthalpy of 2 J/g is observed. In the low temperature phase, domains with several mm thickness parallel to (001) are formed. In the direction [010] the angle of optical extinction of these domains deviates by about  $\pm 6^{\circ}$  from the extinction in the high temperature phase. Both phases exhibit a topotactic structural relation, which however, does not prevent the single crystalline state of the mother crystal to be maintained after the transition. The phase transition is considered to be of weakly first order.

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