

No. 39A-11 (NH₄)₂ZnCl₄, Ammonium tetrachlorozincate*(M* = 243.28; [*D*: 251.33])

1a Ferroelectricity in (NH ₄) ₂ ZnCl ₄ was reported by Belobrova et al. in 1980.						80Bel
b phase	V	IV **)	III	II *)	I	a) 80Bel
state	F ^{a)}	F ^{b)}	P		P	b) 82Sat
crystal system	ortho-rhombic		monoclinic		ortho-rhombic	c) 82Mat1 d) 82Mat2
space group	P2 ₁ cn–C _{2v} ^{c)}		P2 ₁ /c11–C _{2h} ^{e)} f)		Pmcn–D _{2h} ^{d)}	e) 96Mas f) 91Mic
Θ [°C]	–4.5 ^{h)} (–5.5 ⁱ⁾	3 ^{h)} (–0.5 ⁱ⁾)	91 ^{h)}	133 ^{g)}		g) 81Mat h) 84Sat i) 85Deg
*) Incommensurate structural modulation was found along the <i>c</i> axis. See subsection 14a.						
**) Seven-fold super structure along the <i>c</i> axis was reported in phase IV.						91Mic, 96Mas, 81War
<i>P</i> _s [100].						80Bel
$\rho_X = 1.915 \cdot 10^3 \text{ kg m}^{-3}$ at RT.						87Gil
Transparent, colorless. Cleavage plane: (010).						84Sat
2a Crystal growth: slow evaporation of an aqueous solution of NH ₄ Cl and ZnCl ₂ in molar ratio 2:1, and slow cooling of an aqueous solution of 1:1 composition.						80Bel, 91Mic
3a Unit cell parameters: Table 39A-11-001.						
b Crystal structure: Fig. 39A-11-001, Fig. 39A-11-002, Fig. 39A-11-003. Positional and temperature parameters: Table 39A-11-002, Table 39A-11-003; see also Interatomic distances and bond angles: Table 39A-11-004, Table 39A-11-005; Fig. 39A-11-003. Structure of the split atom model: Table 39A-11-006, Table 39A-11-007; Fig. 39A-11-004.						81Ale
4 Lattice distortion: Fig. 39A-11-005, Fig. 39A-11-006, Fig. 39A-11-007. Thermal expansion: Fig. 39A-11-008, Fig. 39A-11-009.						
5a Dielectric constant: Fig. 39A-11-010, Fig. 39A-11-011. Effect of sample history on the dielectric constant, especially dielectric anomaly at 46 °C: see Dielectric dispersion: Fig. 39A-11-012. Θ _{II-I} vs. <i>p</i> : Fig. 39A-11-013. Θ _{IV-III} , Θ _{V-IV} vs. <i>p</i> : Fig. 39A-11-014.						90Mul, 81Mat
c Spontaneous polarization: Fig. 39A-11-015, Fig. 39A-11-016; see also						90Mul
8a Elastic constant: Fig. 39A-11-017, Fig. 39A-11-018, Fig. 39A-11-019. Sound velocity: Fig. 39A-11-020, Fig. 39A-11-021, Fig. 39A-11-022; see also						85Osa
9a Refractive indices: <i>n</i> _a = 1.598, <i>n</i> _b = 1.597, <i>n</i> _c = 1.605 for λ = 514.6 nm at RT. Birefringence: Fig. 39A-11-023, Fig. 39A-11-024.						87Gil

39 (NH₄)₂SO₄ family

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10a	Raman scattering: Fig. 39A-11-025, Fig. 39A-11-026.	
b	Brillouin scattering: Elastic constant from Brillouin scattering; see Fig. 39A-11-017, Fig. 39A-11-018, Fig. 39A-11-019 in subsection 8a.	
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13a	NMR: Fig. 39A-11-027. NQR: Table 39A-11-008, Table 39A-11-009; Fig. 39A-11-028, Fig. 39A-11-029, Fig. 39A-11-030, Fig. 39A-11-031.	
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14a	X-ray satellite reflection due to structural modulation: Fig. 39A-11-032, Fig. 39A-11-033, Fig. 39A-11-034; see also	93deB, 81War
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16	Twin structure: see	85Deg, 93deB
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