

## 30 KNO<sub>3</sub> family

### 30A Pure compounds

#### No. 30A-1 NaNO<sub>3</sub>, Sodium nitrate

( $M = 84.99$ )

1a	Ferroelectricity in high pressure phase III of NaNO <sub>3</sub> was reported by Barnett et al. in 1969.			69Bar	
b	phase	II	I	III *)	
	state			F <sup>a)</sup>	<sup>a)</sup> 69Bar
	crystal system	trigonal	trigonal	trigonal	<sup>b)</sup> 31Edw
	space group	R $\bar{3}$ c–D <sub>3d</sub> <sup>6</sup> <sup>b)</sup>	R $\bar{3}$ m–D <sub>3d</sub> <sup>5</sup> <sup>c)</sup>	R3c–C <sub>3v</sub> <sup>6</sup> <sup>a)</sup>	<sup>c)</sup> 31Kra
	$\theta$ [K]	547.4 <sup>d)</sup>			<sup>d)</sup> 64Mir
	$T_{\text{melt}} = 581$ K.				65Owe
	$\rho = 2.260 \cdot 10^3$ kg m <sup>–3</sup> at 25 °C.				56Swa
	Transparent, colorless. Cleavage plane: {112}.				
	*) Phase III is stable for $p > 4.3$ GPa at RT; see Fig. 30A-1-008.				
2a	Crystal growth: cooling from melt. Single crystal growth and purification by zone-refining method: see			69Bar 90Pho	
3a	Unit cell parameters: $a = 5.071(2)$ Å, $c = 16.825(3)$ Å in the hexagonal frame.			67Che	
b	$Z = 2$ in phases I, II <sup>a)</sup> , and III <sup>b)</sup> .			<sup>a)</sup> 55Men <sup>b)</sup> 69Bar	
	Crystal structure: Table 30A-1-001; Fig. 30A-1-001, Fig. 30A-1-002, Fig. 30A-1-003.				
4	Thermal expansion: Fig. 30A-1-004, Fig. 30A-1-005. Lattice distortion at high pressure: Fig. 30A-1-006.				
5a	Dielectric constant (pressure dependence): Fig. 30A-1-007. Phase diagram with regard to $p$ : Fig. 30A-1-008.				
c	Spontaneous polarization: Fig. 30A-1-009.				
6a	Transition heat of II–I transition: $\Delta Q_{\text{m}} = 3.8 \cdot 10^3$ J mol <sup>–1</sup> .			88Ara	
8a	Elastic stiffness and volume compressibility: Table 30A-1-002; Fig. 30A-1-010; see also			90Hau	
9a	Birefringence: Fig. 30A-1-011. Far infrared absorption: Fig. 30A-1-012, Fig. 30A-1-013.				
10a	Raman scattering at high pressure: Fig. 30A-1-014, Fig. 30A-1-015; see also			85Yag	
b	Brillouin scattering at high pressure: Fig. 30A-1-016, Fig. 30A-1-017.				
13a	NQR: Fig. 30A-1-018, Fig. 30A-1-019, Fig. 30A-1-020.				
14a	Bragg reflections: Fig. 30A-1-021; see also			88Sch	
b	Diffuse scattering: Fig. 30A-1-022, Fig. 30A-1-023. Inelastic neutron scattering: Fig. 30A-1-024.				