No. M18 Sb_5O_7I, Antimony (III) oxide iodide

(M = 847.70)

1a Sb_5O_7I crystallizes in several polytypes (see 1b below).
Ferroelectric activity in Sb_5O_7I of 2MA type was first reported by Nitsche et al. in 1977. 77Nit

b Eight polytypes of Sb_5O_7I are known: Table M18-001.
Most abundant polytype is 2MC-Sb_5O_7I (or α-Sb_5O_7I), which undergoes a phase transition at Θ = 208 °C. But it shows only an elastic anomaly [a]). [a]) 73Kra
Ferroelectric polytype is 2MA-Sb_5O_7I (or β-Sb_5O_7I). Data shown below concern primarily with 2MA-Sb_5O_7I.

phase	II	I	77Nit
state	F	P	
crystal system	monoclinic	hexagonal	
space group	$Pc - C_s^2$	$P\bar{6} - C_{3h}^1$	
Θ [°C]	165		

$\rho = 5.55 \cdot 10^3$ kg m^{-3}. 75Kra
Transparent, colorless.

2a Crystal growth: vacuum sublimation growth technique, see 74Kra, 77Nit

b Crystal form: flat pseudohexagonal prism. 75Kra

3a Unit cell parameters: a = 6.759(3) Å, b = 12.718(6) Å, c = 13.405(6) Å, β = 120.1(1)°; see also Table M18-001. 77Nit

b Crystal structure: Z = 4 in phase II, Z = 2 in phase I. 77Nit
Table M18-002, Table M18-003; Fig. M18-001, Fig. M18-002.
Fractional coordinates and thermal parameters of 2MC-Sb_5O_7I: see 75Kra

5b Ferroelectric hysteresis loop: see 77Nit

c $P_s = 5 \cdot 10^{-3}$ C m^{-2} at RT. 77Nit
P_s is not reversible but reorientable by ± 120° by coercive fields of 200...500 kV m^{-1}.

8a Elastic stiffness measured by ultrasonic techniques: Fig. M18-003.

b Spontaneous strain: $2 \cdot 10^{-2}$. Coercive stress at 20 °C: $1.8 \cdot 10^6$ N m^{-2}; 77Nit
see also Table M18-001.

9a Refractive indices of 2MC-Sb_5O_7I: n_1 = 2.25, n_2 = 2.30(6) for the two main vibration directions in the a-c plane. 77Nit
Double refraction in the a-c plane: $\Delta n = 3.8 \cdot 10^{-2}$ for 2MC-Sb_5O_7I and $3.5 \cdot 10^{-2}$ for 2MA-Sb_5O_7I at RT for λ = 632.8 nm.
Birefringence of 2MA-Sb_5O_7I: Fig. M18-004.
Temporal change in the birefringence by light illumination (photorefractive effect): see 81Fri

e Nonlinear susceptibilities for SHG of Nd-glass laser (λ = 1.06 μm) is about an order of magnitude below that of quartz. 77Nit

10a Raman scattering: Table M18-004; Fig. M18-005, Fig. M18-006.
Raman scattering of 2MC-Sb_5O_7I: Fig. M18-007; see also 75Pre