

## 定比LiNbO<sub>3</sub> 特性表

特性		【当社開発】 定比組成 LiNbO <sub>3</sub> (SLN) スーパーLN
結晶系		三方晶
空間群		R3c
キュリー温度	T <sub>c</sub> (°C)	~1200 ~1220 (MgO doped)
[Li <sub>2</sub> O]:[Nb <sub>2</sub> O <sub>5</sub> ] モル比 (T <sub>c</sub> より推定)		49.9:50.1
格子定数	c <sub>0</sub> (nm)	0.51482
	a <sub>0</sub> (nm)	1.3857
吸収端 <sup>1</sup> <span style="float: right;">表</span>	nm	305
屈折率	n <sub>o</sub>	2.2865 (at 633nm)
	n <sub>e</sub>	2.1898 (at 633nm)
複屈折	n <sub>o</sub> -n <sub>e</sub>	0.0967 (at 633nm)
線形電気光学定数 <sup>2</sup>	r <sub>33</sub> (pm/V)	29.0 (at 633nm)
非線形光学定数 <sup>3</sup>	d <sub>31</sub> (pm/V)	4.7
	d <sub>33</sub> (pm/V)	23.8
分極反転電圧 (室温,抗電界) <sup>4</sup> <span style="float: right;">表</span>	Ec (kV/mm)	< 4
熱伝導率 <sup>5</sup> <span style="float: right;">表</span>	W/(m·K)	5.97 5.62 (MgO doped)
レーザーダメージ閾値 (MgO dopedのみ)	GW/cm <sup>2</sup>	~14 (at 1053nm, 1ns pulse)
Photorefractiveダメージ閾値 <sup>6</sup> <span style="float: right;">表</span>	MW/cm <sup>2</sup>	2 (at 532nm, cw)
GRIIRA <sup>7</sup> <span style="float: right;">表</span>	ppm/cm <sup>2</sup>	~300

<sup>1</sup> Y. Furukawa et al., "Improved Properties of Stoichiometric LiNbO<sub>3</sub> for Electro-Optic Applications", J. Intel. Mat. Sys. Struc. **10**, p.470 (1999)

<sup>2</sup> S. Mori et al., The 55th Spring Meeting, 2008, The Jpn. Soc. Appl.Phys. 28a-ZG-4, p.1222 (2008)

<sup>3</sup> I. Shoji et al., The 67th Autumn Meeting, 2006, The Jpn. Soc. Appl. Phys. 30p-ZX-2, p.1080 (2006)

<sup>4</sup> V. Gopalan et al. "The role of nonstoichiometry in 180° domain switching of LiNbO<sub>3</sub> crystals", Appl. Phys. Lett. **72**, p.1981 (1998)

<sup>5</sup> K. Kitamura et al., Oyo buturi **74**, p.573 (2005)

<sup>6</sup> Y. Furukawa et al., "Stoichiometric Mg:LiNbO<sub>3</sub> as an effective material for nonlinear optics", Opt. Lett. **23**, p.1981 (1998)

<sup>7</sup> Y. Furukawa et al., "Elimination of photorefractive and green-induced-infrared-absorption in MgO-doped near-stoichiometric LiNbO<sub>3</sub>"  
Topical meeting on Advanced Solid-State Lasers (ASSL), p.480 (2000)

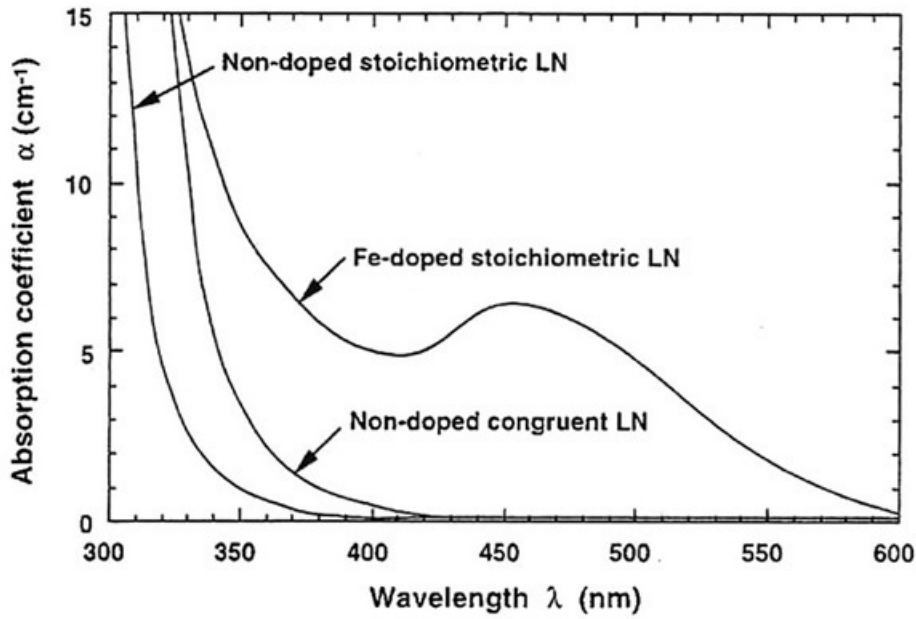


Figure 5. Absorption spectra of as-grown  $\text{LiNbO}_3$  crystals.

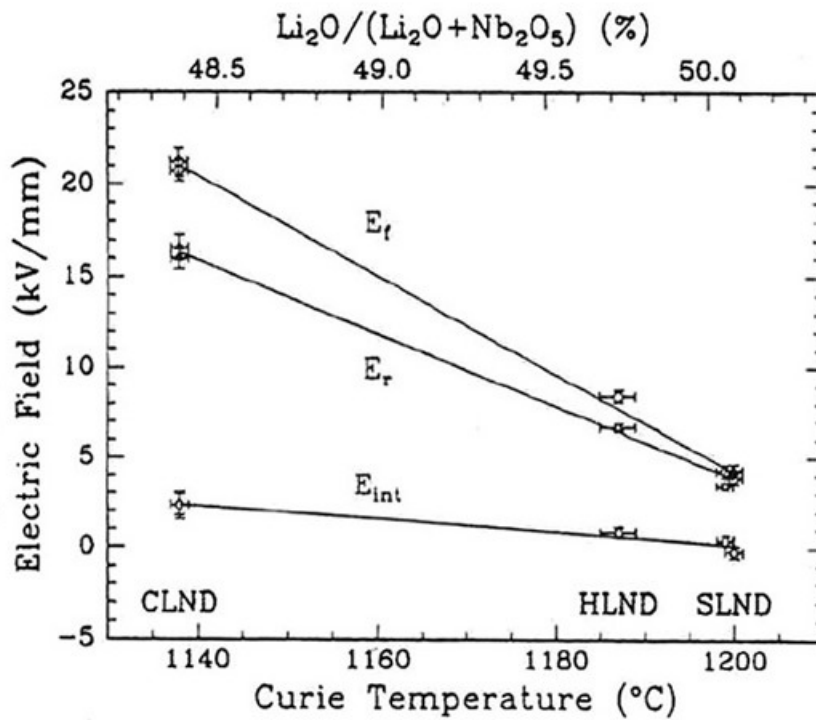


FIG. 2. The switching fields,  $E_f$  for forward poling and  $E_r$  for reverse poling, and internal field  $E_{int}$  as a function of the measured Curie temperatures,  $T_c$ , of  $\text{LiNbO}_3$  crystals with low hydrogen content (samples CLND, SLND, and HLND).

◆熱伝導率

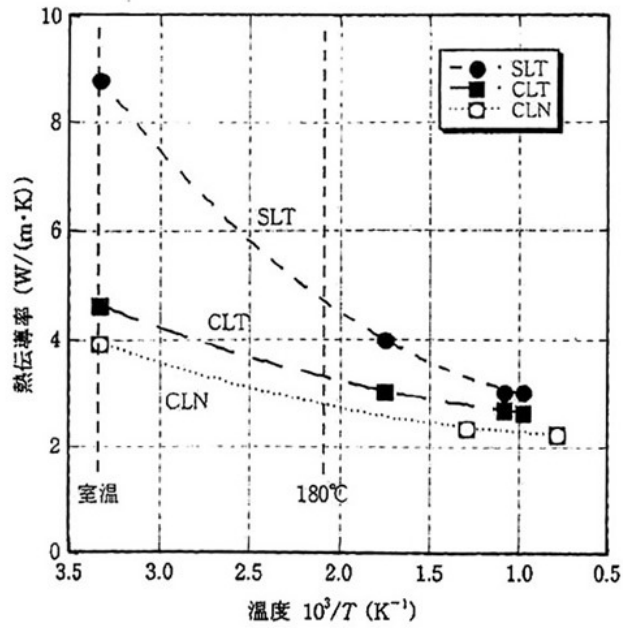


図9 SLT, CLT, CLNの熱伝導率の温度依存性, 熱伝導率は温度と反比例し, 室温から200°Cまで上昇すると著しく減少する.

◆Photorefractiveダメージ閾値

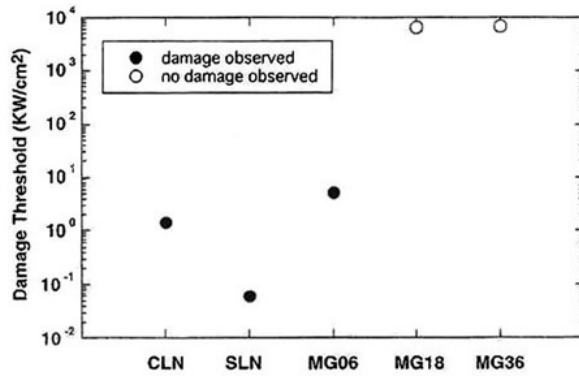


Fig. 1. Photorefractive damage threshold for CLN (congruent LiNbO<sub>3</sub>), SLN (stoichiometric LiNbO<sub>3</sub>), MG06 (MgO 0.6-mol. % doped SLN), MG18 (MgO 1.8-mol. % doped SLN), and MG36 (MgO 3.6-mol. % doped SLN).

◆GRIIRA

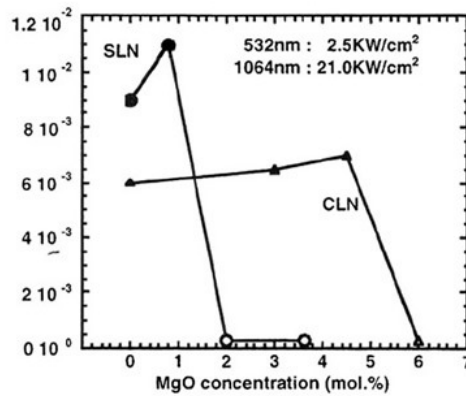


Fig. 3. Green induced infrared absorption versus MgO concentration in SLN and CLN crystals.