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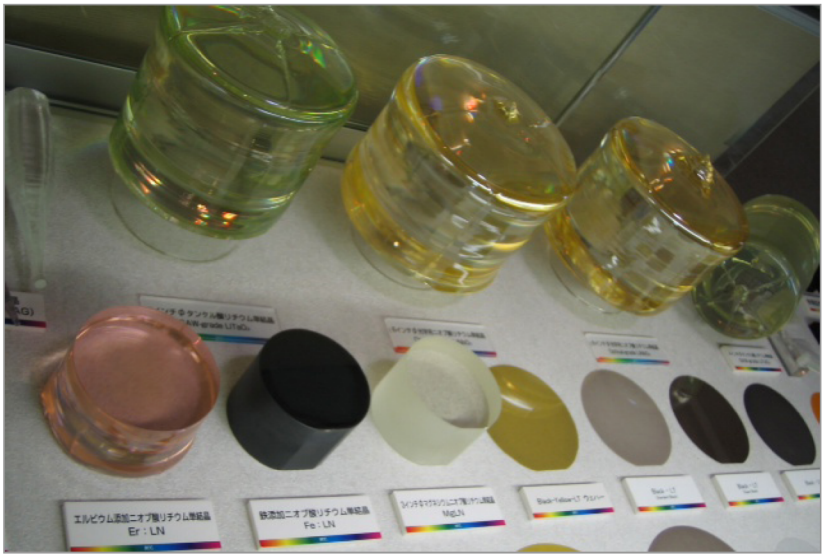
Lithium Niobate Properties



Fundamental Properties

Item		
Melting Point		1253Â° C
Crystal System		Trigonal
Point Group		3m
Crystal Density		4.647 x 10³ kg / m³
Curie Temperature (Tc)		1133 Â± 3Â°C
Heat Capacity (Cp)		89 J / k.mol
Dielectric Constants	$(^{T}_{11})$	85.2
Dielectric Constants	$(^{T}_{11})$	85.2
	$(^{T}_{33})$	28.7
Elastic Constants	(C^{E}_{11})	2.03 x 10^{11} N / m^2
	(C^{E}_{12})	0.573
	(C^{E}_{13})	0.752
	(C^{E}_{14})	0.085
	(C^{E}_{33})	2.424
	(C^{E}_{44})	0.595
Piezoelectric Strain Constants	(e_{15})	3.7 C / m^2
	(e_{22})	2.5
	(e_{31})	0.23

Item		
	(e_{33})	1.33

Typical Acoustic Properties

Surface Acoustic Wave Properties

Description	Propagation	Design	Surface Wave Velocity (m/s)	Coupling Coefficient k² (%)	Group Delay Time Temp Coefficient (ppm/Â°C)	Propagation Loss of SAW (dB/cm)
127.86Â° Y - Cut	X - Axis	SAW	3980	5.5	75	-
64Â° Y - Cut	X - Axis	L, SAW	4742	11.3	70	-
41Â° Y - Cut	X - Axis	L, SAW	4792	17.2	50	-
Y - Cut	Z - Axis	SAW	3488	4.9	94	0.31 (1GHz)
SAW = Surface Acoustic Wave L, SAW =Leaky SAW						

Selective Piezoelectric Coupling Factors & Frequency Constants

Plate Orientation	Wave Type	Coupling Factor	Resonance Frequency Constant (MHz-mm)
X	S	0.68	1.838
Z	E	0.17	3.615
36Â° Y - Cut	QE	0.49	3.300
163Â° Y - Cut	QS	0.62	1.866
E = extensional S = shear QE = quasi - extensional QS = quasi - shear			

Typical Optical Properties

Electro-Optic Coefficients r(10^{-12} mV^{-1}) at 632.8 nm

$_rT_{13}$	10	$_rS_{13}$	11
$_rT_{22}$	6.8	$_rS_{22}$	3.4
$_rT_{33}$	32.2	$_rS_{33}$	36.7
$_rT_{51}$	32	$_rS_{51}$	18.2

Nonlinear Optical Coefficients at 1-06 µ m (*d_{31}=d_{15})

d_{22} / I d_{36}^{KDP} I	6.5
d_{31} / I d_{36}^{KDP} I	-12.3
d_{33} / I d_{36}^{KDP} I	-86

Refractive Index at 632.8 nm

n_o	2.2880
n_e	2.2030
n_o: TE mode n_e: TM mode	