

SrLaAlO₄ Single Crystal

SrLaAlO₄ crystal is a promising substrate material for high T_c superconductor film and other oxide films. It has similar lattice constant to SrTiO₃, but better quality and lower cost because of CZ growth and lower melting point) MTI produces SrLaAlO₄ crystal and substrate in house up to 35 mm

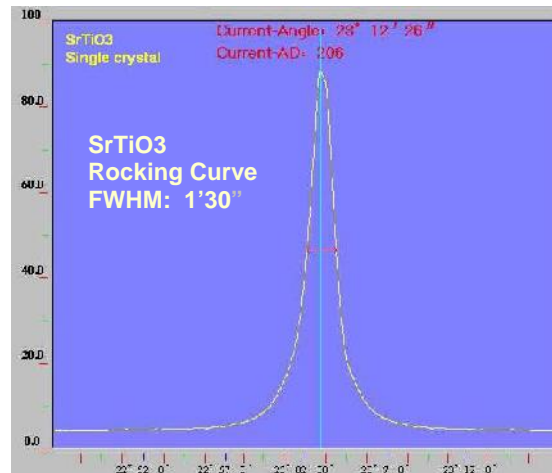
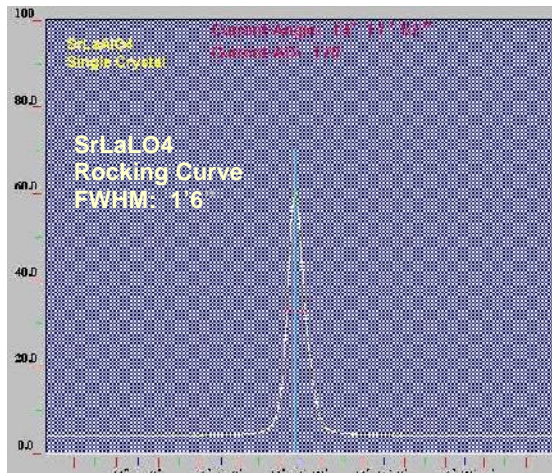
TECHNICAL DATA

Crystal growth method	Czochralski
Crystallographic structure	Tetragonal Space group I4/mmm
Lattice constant	a = 0,3754 nm c = 1,2630 nm
Twinning structure	No
Colour	Colorless-Yellow
Density	5,924 g/cm ³
Melting point	1650°C
Hardness	at <001> : 3512 MPa at <100> : 6349 MPa
Thermal expansion coefficient	along a-axis : (7,55 ± 0,02) x 10 ⁻⁶ K ⁻¹ along c-axis : (1,71 ± 0,02) x 10 ⁻⁵ K ⁻¹
Thermal conductivity	8,82 W/mK@300 K 7,50 W/mK@450K
Dielectric constant	17
Dielectric loss tangent	8 x 10 ⁻⁴
Specific resistivity	0,33 x 10 ¹⁵ Wm
Transmission range	240 ÷ 6670 nm
Refraction index	1,926
Dispersion (n _r -n _c)	0,002

Comparison of SrTiO₃ - LaAlO₃ - SrAlO₄ Crystal

Properties/Crystal Structure	SrTiO ₃	LaAlO ₃	SrLaAlO ₄
Structure	Cubic	Cubic at >435°C	Tetragonal
Lattice Constant	a=3.905	a=3.821 Å	a=b=3.756 Å c= 12.630
mismatch to YBCO a=3.9	+0.12%	-2.0%	-3.7%
Dielectric Constant	~ 300	~ 25	~ 17
Grown Method	Vernuil	CZ	CZ
Melting point °C	2100	2080	1650
Density	5.175 g/cm ³	6.52 g/cm ³	5.92 g / cc
Max. Crystal size	30 mm dia.	75 mm dia	35 mm dia
Crystal quality	Wide rocking curve due to dislocation density	Visible twin due to phase transition around 400 oC	Narrow rocking curve, no twins, less defects
Crystal cost	Higher	Lower	Medium

Typical Rocking Curves: SrLaAlO₄ vs SrTiO₃



MTI Corporation

860 South 19th Street, Richmond, CA 94804, USA

Tel: (510)525-3070 Fax: (510)525-4058 E-mail: info@mtixtl.com Website: www.mtixtl.com