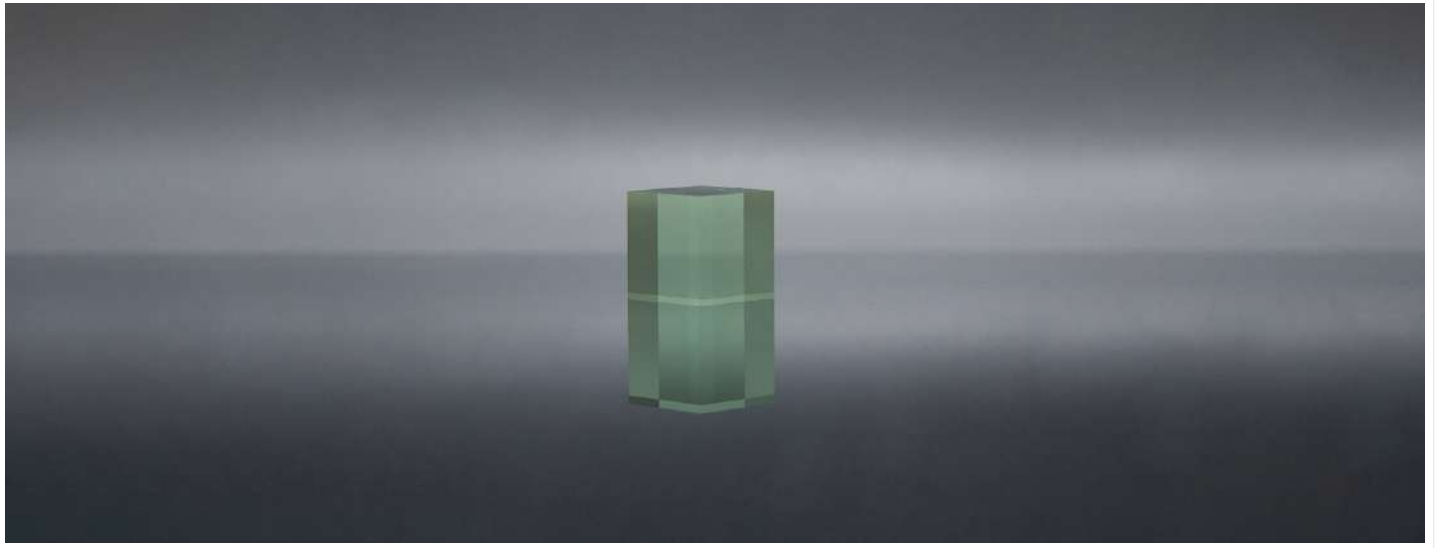


LiSAF



DESCRIPTION

Lithium strontium hexafluoroaluminate (LiSAF) crystals are widely used as vacuum ultraviolet (VUV) and ultraviolet (UV) laser host media. It has excellent transmission characteristics down to the vacuum ultraviolet (VUV) region. The transmission edge of LiSAF was measured experimentally to be 116nm. LiSAF (LiSrAlF₆) are excellent laser materials with high energy storage and high slope efficiency, also ideal working material under conditions of ultra short pulse and ultra high power. Like Ti:sapphire, LiSAF exhibits a broad bandwidth, tunable from 760 to 1000 nm. Unlike Ti:sapphire, however, it has a relatively long upper-state lifetime (60μs) and, therefore, can be flashlamp-pumped. This advantage, coupled with the fact that LiSAF has a low nonlinear refractive index and low thermal lensing, make it an ideal candidate for high-power short pulse laser systems.

APPLICATIONS

- Laser host media
- Lens in VUV photolithography

FEATURES

- Large band gaps and low phonon energies
- Absorption edge is 116nm
- Small non-linear refractive indices
- Optical transmission and low thermal lensing distortion
- Transparency, tolerance to laser-induced damage



LiSAF

PARAMETERS

Material and Specifications

Orientation Tolerance	5'
Parallelism	<10"
Perpendicularity	5'
Chamfer	0.1mm@45°
Surface Quality	10/5 or better
Wavefront Distortion	$\lambda/8$ @632.8 nm
Surface Flatness	$\lambda/10$ @632.8 nm
Clear Aperture	>95%
Diameter Tolerance	+0/-0.05mm
Length Tolerance	±0.1mm
Coatings	As per requirement
Damage Threshold	over 15J/cm ² TEM00, 10ns, 10Hz
Dopant Concentration Tolerance	0.001

Physical and Chemical Properties

Lattice	HexagonalL
Space Group	P31C
Lattice Constants	a=5.08, c=10.214Å
Density (g/cm ³)	3.45
Melting Point	750°C
Thermal Conductivity(W·m ⁻¹ ·K ⁻¹)	3.09(// a), 4.58(// c)
Thermal Expansion(10 ⁻⁶ ·K ⁻¹)	-10(// a), 18.8(// c)
Specific Heat(J·g ⁻¹ ·K ⁻¹)	0.842
Fracture Toughness(MPa·m ^{1/2})	0.4
Band Gap(eV)@LDA	7.92(indirect)
Young's Modulus(GPa)	86.33(// a), 83.45(// c)
Bulk Modulus(GPa)	83.75
Dielectric Constant	1.26

Optical characteristics

Absorption Edge	116nm
Refractive Index	no=1.3944, ne=1.3988@632,8nm
Thermal-optical Coefficient(10 ⁻⁶ /°C)	-4.5(no), -9.1(ne)

Index of Refraction

Wavelength(nm)	no	ne
632.8	1.3944	1.3988
546.1	1.3972	1.4011
435.8	1.4014	1.4052
253.7	1.422	1.4276

