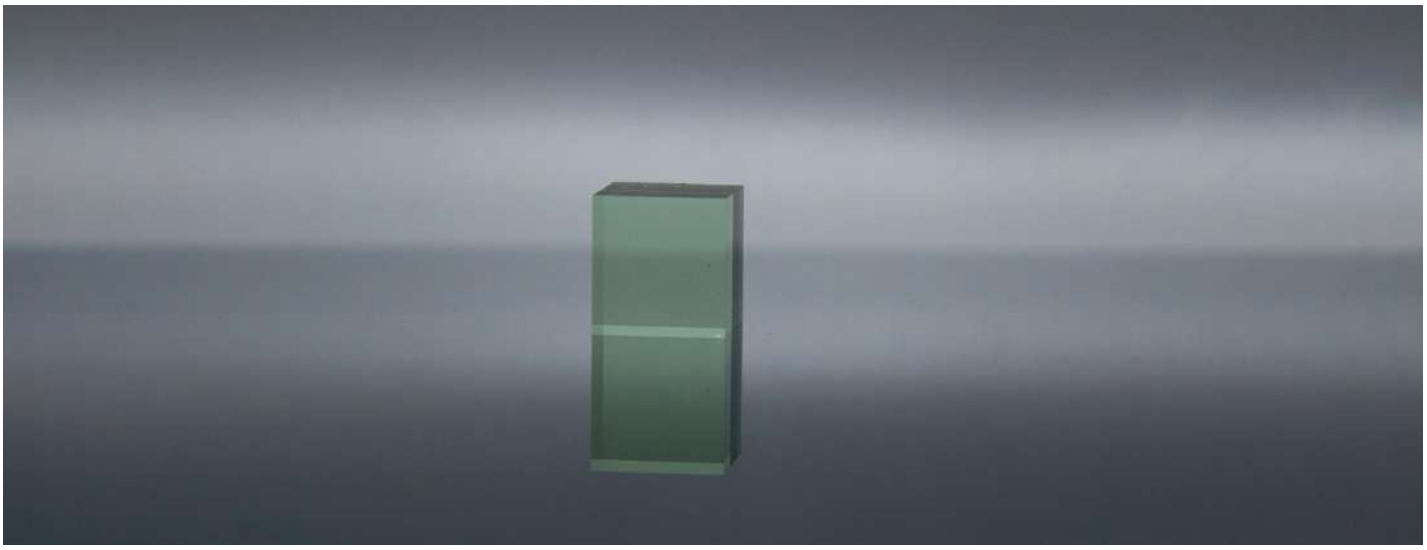
Ce:LiSAF



DESCRIPTION

ithium strontium hexafluoroaluminate (LiSrAlF6, LiSAF) are excellent host materials for tunable all-solid-state lasers in the UV region when doped with trivalent cerium(Ce:LiSAF).The gain spectra of Ce:LiSAF is in the range 280-320 nm and is characteristic of the Ce3+ 5d1–4f1 interconfigurational transition. Ce:LiSAF is attractive UV solid-state laser materials with the central emission wavelength at 290 nm and a practical tuning range from 288 to 315 nm. The slope efficiencies of Ce:LiSAF has been reported to reach as high as 29%. The broad gain-bandwidth of this fluoride crystals in the UV region has made it appealing for ultrashort-pulse generation and amplification. It can also be pumped by the fourth harmonic of a Nd:YAG laser. Ce:LiSAF is the preferred material of the colquiriite hosts, since it shows higher gains than Ce:LiCAF.

APPLICATIONS

- Scintillator
- Tunable ultraviolet lasers
- Remote-sending applications
- Ultrafast pulse generation and amplification
- Power UV laser amplifiers

FEATURES

- Large band gaps and low phonon energies
- High fluorescence efficiencies
- Small non-linear refractive indices
- Characteristic of the Ce3+5d1–4f1 interconfigurational transition
- Broad UVtunability (from 280 to 325 nm)
- Transparency, tolerance to laser-induced damage
- Can be pumped by the fourth harmonic of a Nd:YAG laser

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Ce:LiSAF

PARAMETERS

Material and Specifications

Orientation Tolerance	5′
Parallelism	<10″
Perpendicularity	5′
Chamfer	0.1mm@45°
Surface Quality	10/5 or better
Wavefront Distortion	λ/8 @632.8 nm
Surface Flatness	λ/10 @632.8 nm
Clear Aperture	>95%
Diameter Tolerance	+0/-0.05mm
Length Tolerance	±0.1mm
Coatings	As per requirement
Dopant Concentration Tolerance	0.001

Physical and Chemical Properties

Crystal Structure	Trigonal
Space Group	P31C
Lattice Constants	a=5.08, c=10.15Å @1mol%CeF3
Density (g/cm3)	3.45
Melting Point	766°C
Thermal Conductivity(W·m-1·K-1)	3.1
Thermal Expansion(10-6K-1)	21.6(//a),-6.7(//c)

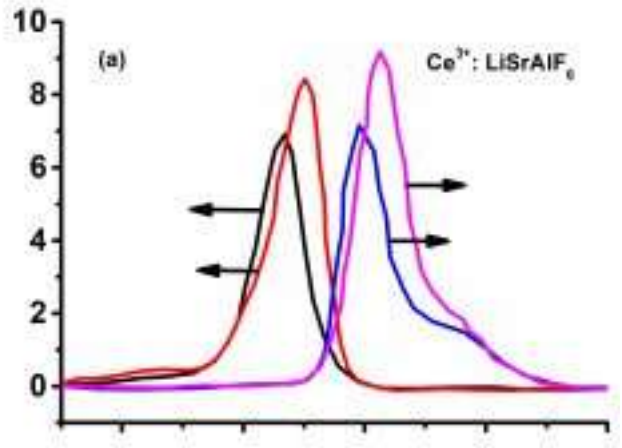
Index of Refraction

λ(μm)	n	λ(μm)	n	λ(μm)	n
0.18	1.51	0.32	1.45	5.82	1.39
0.19	1.5	0.43	1.44	6.2	1.38
0.21	1.49	0.88	1.43	6.71	1.37
0.22	1.48	2.67	1.42	7	1.36
0.24	1.47	3.94	1.41	7.53	1.35
0.27	1.46	5.01	1.4	8.22	1.34

Optical characteristics

Absorption Cross-section (10-18cm2)@266nm	7.3(π), 6.6(σ)
Absorption Coefficient@266nm	7cm-1
Refractive Index	n=1.42
Peak Lasing Wavelength(nm)	290
Fluorescence Lifetime(ns)	28
Emission Cross-section (10-18cm2)@290nm	9.5(π), 6.1(σ)
Laser Threshold(μJ)	15-25
Laser Slope Efficiency	0.29
Estimated Pumping Efficiency	50(π), 20(σ)
ESA Cross-section(10-18cm2) @266nm	6.5π), 23(σ)
Gain Cross-section(10-18cm2) @290nm	6.8(π), 1.5(σ)
Saturation Fluence(mJ/cm2)	100

Spectrum



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