# **Cr-doped Colquiriite (Cr:LiSAF)**

### Introduction

**CASTECH** provides high quality, Cr-doped Colquiriite crystal (Cr:LiSAF) using the Czochralski technique. It is excellent laser material with high energy storage and high slope efficiency. It is also ideal working material under conditions of ultra short pulse and ultra high power. Currently, Cr:LiSAF related products such as flashlight pumping and diode pumping laser have been widely used.

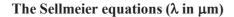
### **Physical and Optical Properties**

#### **Physical Properties**

Chemical Formula	Cr <sup>3+</sup> :LiSrAlF <sub>6</sub>	
Lattice Parameters(Å)	a=5.084	
	c=10.21	
Crystal Structure	trigonal	
Space Group	P31c	
Cr atoms/cm <sup>3</sup> for 1% doping	8.75x10 <sup>19</sup>	
Fracture Toughness(Mpam)	0.40(lc)	
Melting Point (℃)	766	
Density(g/cm³)	3.45	
Modulus of Elasticity(GPa)	109	
Thermal Expansion	-10(lc)	
Coefficient (10 <sup>-6</sup> /K)	25(±c)	
Thermal Conductivity (W/m/K)	3.3(lc)	
	3.0(⊥ c)	
Specific Heat(J/g·K) (@25°C)	0.842	

#### **Optical Properties**

Emission Peak(nm)	846
Peak Stimulated Emission Cross Section(×10 <sup>-20</sup> cm <sup>2</sup> )	4.8(lc)
Spontaneous Fluorescence Lifetime(μs)	67
Scatter Losses(%/cm)	<0.2
dn/dT(×10-6/0C)	-4.8(lc)
	-2.5(⊥c)



 $\begin{array}{l} n_c^{~2}\!=\!1.98448\!+\!0.00235\!/(\lambda^{^2}\!-\!0.010936)\!-\!0.01057\lambda^{^2} \\ n_a^{~2}\!=\!1.97673\!+\!0.00309\!/(\lambda^{^2}\!-\!0.00935)\!-\!0.00828\lambda^{^2} \end{array}$ 

Crystal	Wavelength(nm)	$n_{c}$	n <sub>a</sub>
Cr:LiSAF	846	1.407	1.405
	670	1.409	1.407
	423	1.413	1.412
	290	1.420	1.420
	266	1.422	1.424

## **Specifications of Cr:LiSAF**

• Size: Rod sizes from 2mm to 16mm in diameter and from 1mm to 180mm in length

• Cr dopant concentrations: 0.5~1.0 mol%

• Parallelism: <10 arc seconds

Perpendicularity: <5 arc minutes</li>
Chamfer: 0.13 ± 0.07mm X 45°

• Scratch/Dig code: 10/5 to MIL-PRF-13830B

• Flatness: λ/8 @ 632.8nm

• AR coating: R<0.10% @ 850nm

Large rod and slab dimensions and non-standard dopant concentrations are available upon request.