

# Er:YLF



## DESCRIPTION

CRYLINK's Er:YLF crystal products, also known as erbium-doped yttrium fluoride lithium crystal. It is a kind of crystal product with excellent comprehensive performance. It is widely used in industrial, medical and scientific research fields. The product has the characteristics of low nonlinear refractive index, low phonon frequency and long life laser emission level. It can be used in 2940nm erbium laser, 3  $\mu\text{m}$  laser Q switch, upconversion visible light laser, laser ranging products.

## FEATURES

- Low phonon frequency
- Negative thermal light coefficient
- Long laser emission energy level life
- Wide range of transparency (from VUV to 10  $\mu\text{m}$  region)

## APPLICATIONS

- Lasers for laser guidance systems
- Industrial, medical and scientific applications
- Laser ranging (Er:YLF crystal laser wavelength - 0.85 $\mu\text{m}$ )
- Eye safe target concentrating laser system (Er:YLF crystal, wavelength - 1.73 $\mu\text{m}$ )
- Continuous wave and Q switch - 3 $\mu\text{m}$  laser for oral surgery, dentistry, implant dentistry and otolaryngology
- Used to display technology, medical (diagnosis and treatment) of the upper conversion of visible light lasers
- Complex measurement systems use a variety of laser wavelengths: (Er:YLF crystal laser wavelength 0.85-1.73 $\mu\text{m}$ )



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## PARAMETERS

### STANDARD

Orientation	A-cut
Parallelity	<10"
Perpendicularity	<10'
Surface finish	10-5 S-D
Wavefront distortion	< $\lambda$ /4 per inch@632.8 nm
Flatness	< $\lambda$ /10 @632.8 nm
Clear aperture	>90%
Surface tolerance	+0.0/-0.1 mm
Length tolerance	$\pm$ 0.1mm
Chamfer	<0.1mm@45°

### PHYSICAL AND CHEMICAL PROPERTIES

Structural symmetry	Cubic
Lattice constant	a=5.173, c=10.747 Å@1.5%
Density	3.95g/cm <sup>3</sup>
Melting point	819°C
Thermal conductivity/(W·m <sup>-1</sup> ·K <sup>-1</sup> )	~ 5
Specific heat(J·g <sup>-1</sup> ·K <sup>-1</sup> )	0.79
Thermal expansion/(10 <sup>-6</sup> ·K <sup>-1</sup> )	8
Hardness (kg/mm <sup>2</sup> @Mohs)	5
Yang's modulus/(108g/cm <sup>2</sup> )	7.65

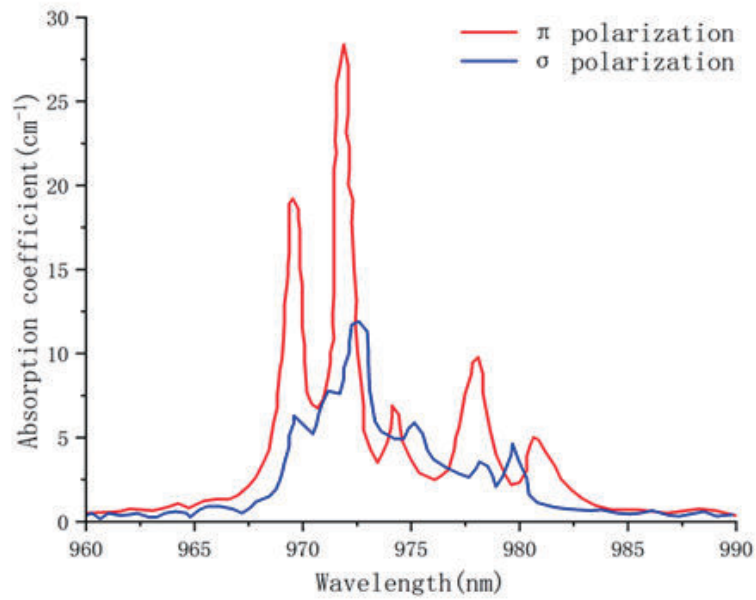
### OPTICAL PROPERTIES

Typical doping levels	0.15
Refractive index(@2070nm)	n <sub>0</sub> =1.442, n <sub>e</sub> =1.464
Thermo-optical coefficient (10 <sup>-6</sup> ·K <sup>-1</sup> )	-2(IIa), -4.1(IIc)
4I11/2 Er level lifetime (ms)	4
Emission cross-section(10 <sup>-20</sup> /cm <sup>2</sup> )	1.5@2800nm
Absorption peak wavelength	972nm
Absorption coefficient of peak wavelengths	28cm <sup>-1</sup>
Absorption bandwidth at peak wavelengths	~ 1nm
Laser wavelength	2810nm

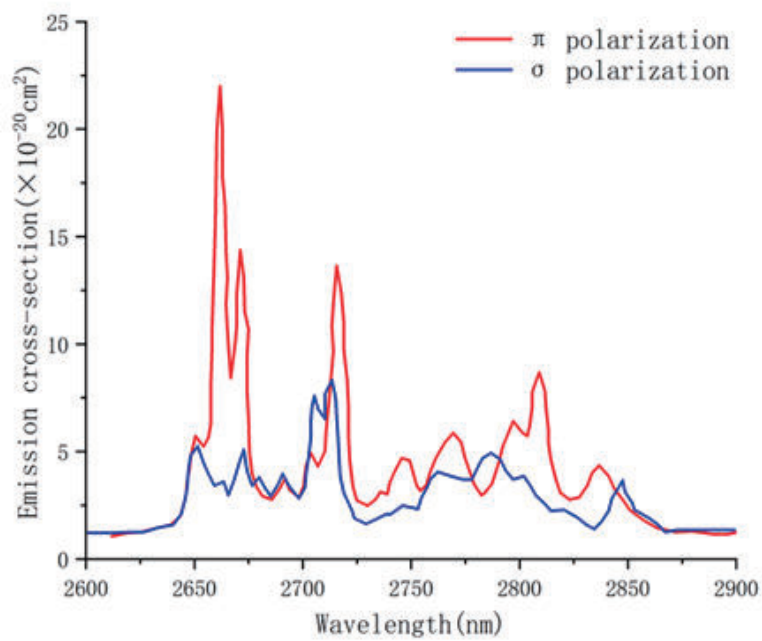


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## SPECTRA



Er (15%): YLF absorption curve



Er (15%): YLF emission curve

