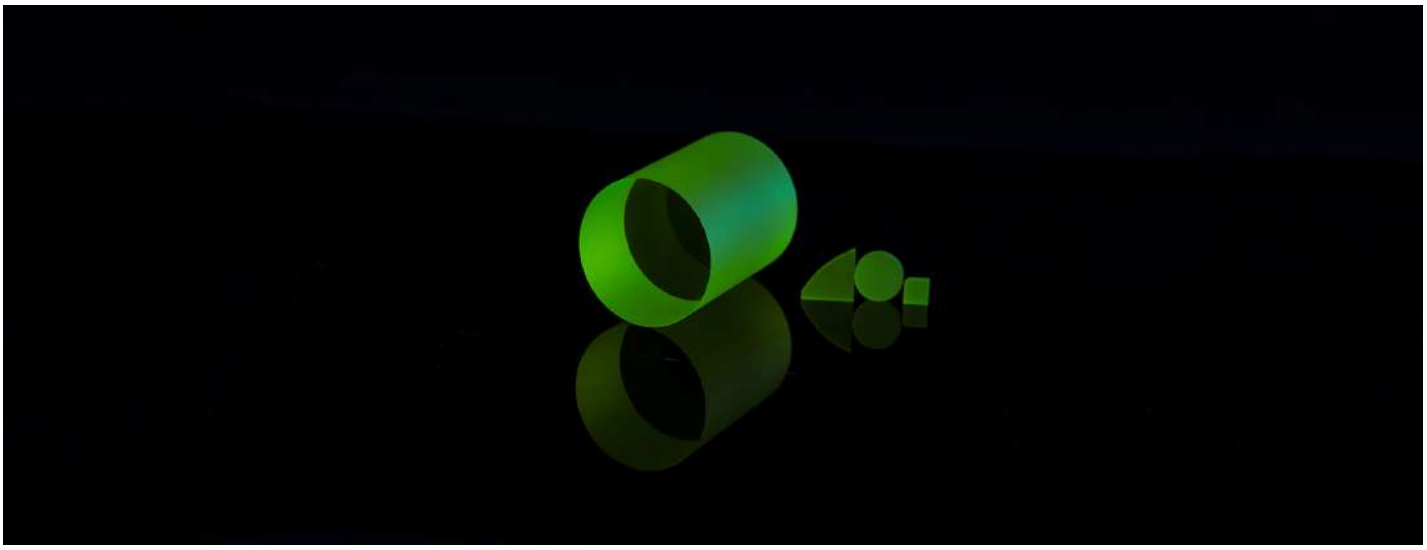
Pr:YLF



DESCRIPTION

Pr3+:YLF has been found as promising laser material for producing visible lasers directly. Many trivalent rare-earth ions (RE3) exhibit visible radiative transitions that potentially enable visibly emitting solid-state lasers. So far, various visible lasers based on RE3+-doped crystalline media have been demonstrated. Among them, trivalent praseodymium ion (Pr3) is recognized as one of the most successful active ions for achieving efficient visible lasers because the visible transitions of Pr3+ follow a four-level system, and their emission cross sections are larger than that of other RE3+. Many other RE3+ also exhibit visible transitions; however, these are often spin-forbidden, resulting in very small absorption and emission cross sections. Moreover, some visible transitions in RE3+ follow a three-level system, which is unattractive for laser demonstration. Only few laser materials have necessary properties for realization of lasing in visible spectral range. Trivalent praseodymium (Pr3+) is known to be an interesting laser ion for using with solid-state lasers in the visible spectral range because of its energy levels scheme, providing several transitions in the red (640 nm, 3P0 to 3F2), orange (607 nm, 3P0 to 3H6), green (523 nm, 3P0 to 3H5), and dark-red (720 nm, 3P0 3F3+3F4) spectral regions.

APPLICATIONS

- Broadband Laser Mirrors
- Wavelength Separators and Combiners
- Polarizing Cubes
- Diode-pumped solid-state lasers for precise and ef ficient processing of metals such as copper or gold ,entertainment industry and science

FEATURES

- Custom Crystals Available Upon Request
- Lines of the InGaN Laser Diodes and 2ω-OPSL
- High absorption and emission cross-sections(～10-19cm2)

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Pr:YLF

PARAMETERS

Material and Specifications

Orientation	a-cut
Parallelism	<10″
Perpendicularity	<10′
Surface Quality	10-5 S-D
Wavefront Distortion	<λ/4 per inch@632.8 nm
Surface Flatness	<λ/8 @632.8 nm
Clear Aperture	>90%
Face Dimensions Tolerance	+0/-0.1 mm
Length Tolerance	±0.1mm
Chamfer	0.1mm@45°
Coatings	R<1%@440-444nm+R<0.6% @500-700nm on both faces
Laser Induced Damage Threshold	>5J/cm2@532nm, 10ns

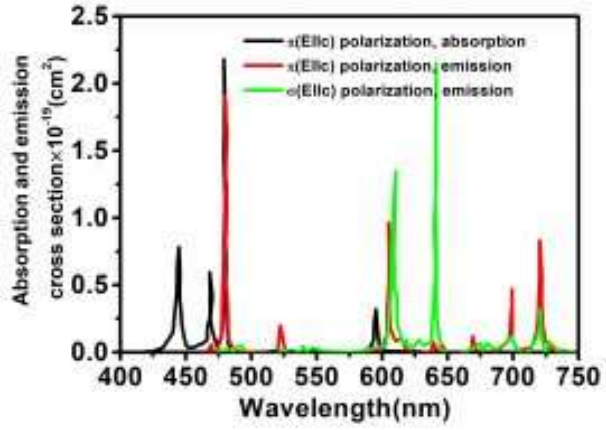
Optical Characteristics

Typical Doping Level	1@.%
Refractive Index (@1064nm)	no=1.448, ne=1.470
Thermo-optic Coefficient （10-6·K-1）	-5.2(// c), -7.6(// a)
Lifetime of 3P0 Erbium Energy Level(μs)	50
Emission Cross Section (10-20/cm2)	20×10-20cm2
Absorption Peak Wavelength	444nm
Absorption Cross Section at Peak	8×10-20cm2
Absorption Bandwidth at Peak Wavelength	～5nm
Laser Wavelength	640nm

Physical and Chemical Properties

Structure Symmetry	Tetragonal
Lattice Constants	a=5.164, c=10.732 Å
Specific mass	3.95g/cm3
Melting Point	819°C
Thermal Conductivity /(W·m-1·K-1)	6
Thermal Expansion /（10-6·K-1）	～16
Hardness (@Mohs)	5

Spectrum



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