Er:YAG

DESCRIPTION

Er YAG laser Crystal—50% Erbium doped in YAG which can stimulate 2940nm laser used in medical and dentistry
Erbium doped Yttrium Aluminum Garnet (Er:$Y_3Al_5O_{12}$ or Er:YAG) combine various output wavelength with the superior thermal and optical properties of YAG. It is an excellent laser crystal which lasers at 2.94μm. This wavelength is the most readily absorbed into water and hydroxylapatite of all existing wavelengths and is considered a highly surface cutting laser. It is a well known material for medical applications.
The emission wavelength of Er:YAG with doping concentration of 50% is 2940nm, which is at the position of water absorption peak and can be strongly absorbed by water molecules. Therefore, it is widely used in the field of plastic surgery and dentistry. At present, the projects we have participated in include laser blood collection instrument, which adopts the structure of both sides of Er:YAG rods coated and xenon lamp end pumped. the Er-YAG laser wavelength is an excellent choice for improvement of a variety of skin conditions and features of aging, including dyschromia, actinic photodamage, solar elastosis, acne and traumatic scarring, fine lines and mild to moderate rhytidosis, coarse skin texture, and skin laxity.

PARAMETER

Optical and Spectral Properties

Laser Transition	4I11/2 → 4I13/2 (highly doped); 4I13/2 → 4I15/2 (low doped)
Laser Wavelength	2940 nm (highly doped); 1645 nm (low doped)
Photon Energy	6.75×10-20J@2940nm
Pump Absorption Band Width	600~800 nm (highly doped); 1530 nm (low doped)
Damage Threshold	>500MW/cm2
Emission Cross Section	3×10-20 cm2
Fluorescence Lifetime	0.23 ms (highly doped); 2~5 ms (low doped)
Refractive Index	1.7838@2940 nm

FEATURES

- Large electro-optic coefficient
- Not easy to deliquesce
- High sensitive
- Wide transparency range
- High optical damage threshold
- Stable chemical and physical properties

www.laser-crylink.com
sales@crylink.com
+86-21-66566068
Building 7, No.718 Baoqi Road, Baoshan District, Shanghai, China

Material and Specifications

Orientation	[100] or [100] <± 0.5。
Parallelism	10″
Perpendicularity	5′
Surface Quality	10-5
Wavefront Distortion	< λ/8@632 nm
Surface Flatness	<λ/10@632.8nm
Clear Aperture	>90%
Chamfer	0.1mm@45°
Thickness/Diameter Tolerance	±0.05 mm
Maximum Dimensions	Diameter:2mm-50mm, Length:5mm-180mm
Coatings	< 0.25% @ 2940 nm

Physical and Chemical Properties

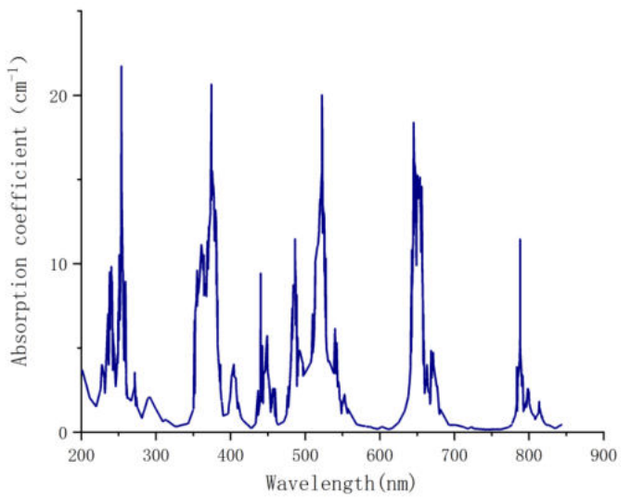
Crystal Structure	cubic – la3d
Lattice Constants	12.01
Density	4.56-5.11 g/cm3
Melting Point	1950°C
Thermal Conductivity/(W·m-1·K-1@25°C)	0.14W
Specific Heat/(J·g-1·K-1)	0.59
Thermal Shock Resistance	790W/m
Thermal Expansion /(10-6·K-1@25℃)	7.8
Hardness (Mohs)	8.5
Young`s Modulus /GPa	317
Shear Modulus /Gpa	54.66
Extinction Ratio/dB	30
Barrel Finish	Ground Finish 400#Grit
Poisson Ratio	0.25

APPLICATIONS

- 2940nm Laser

SPECTRA

Absorption



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