LASER CRYSTAL SERIES

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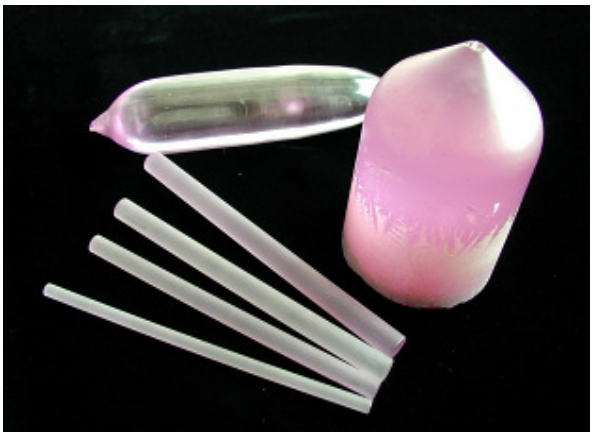
SUPER - Nd:YAG Laser Crystal Rods

Introductions



During the last decade, Nd: YVO_4 has been developed as promising substitutes for Nd: YAG in diode-pumped solid-state lasers due to its high absorption and emission cross-sections. However, the applications of YVO_4 are limited due to its poor physical-mechanical properties and growth difficulty etc. Our high-doped Nd: YAG (SUPER - Nd:YAG) were developed, which shows high absorption cross -section and have many advantages over Nd:YVO_4.

*** Due to cubic symmetry and high quality, Nd: YAG is easy to work at TEM_{00} mode;**
*** Nd: YAG can be Q-switched with Cr^{4+}:YAG directly;**
*** Nd: YAG can produce blue laser with the frequency doubling of 946nm;**
*** Nd: YAG can be operated in a very high power laser up to kW level;**

The high neodymium doped YAG has been grown by our novel technology called ***Temperature Gradient Technique*** (TGT). The Nd concentration can be doped up to 3 at%. As large as $\phi 100 \times$ L 80mm bulk crystals with excellent optical homogeneity, less scattering particles, low dislocation density have been achieved.

Laser Properties

* SUPER-Nd: YAG shows high absorption coefficients at pumping wavelengths. Therefore, a crystal short-in length (e.g.1mm) is preferred, and compact microchip lasers can be constructed by using SUPER-Nd: YAG.

* Due to the broader and smoothly varied bandwidth of absorption, it allows of less stringent requirements of temperature control.

* Almost same output have been achieved both in a (111)-cut 1mm long Nd: YAG and an a-cut 1mm long YVO_4 microchip lasers with a very short (9mm) laser cavity.

Contact Information:

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Local Representative:

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Spectral Properties:

Nd-Dopant	2.5at%	2at%	1.5at%	1.3at%	1.1at%	1at%
Fluorescence lifetime	160μs	180μs	200μs	210μs	220μs	240μs
Absorption Coefficient (@ 800nm)	7.55cm^{-1}	6.57 cm^{-1}	5.36 cm^{-1}	4.66 cm^{-1}	3.88 cm^{-1}	3.55 cm^{-1}

Standard Specifications:

Nd-dopant Level:	0.7, 0.9, 1.0, 1.1, 1.3, 1.5, 2.0, 2.5 ± 0.1 at%
Standard Dimension:	3 × 3 × 3 mm^3, 3 × 3 × 1mm^3
Diameter:	ϕ 3 ~10mm
Length:	< 180mm
Optical Quality:	< 0.5 fringes/inch
Diameter Tolerance:	± 0.05mm
Length Tolerance:	± 0.7mm
End-face Perpendicularity:	< 5 arc minutes
Parallelism:	<10 arc seconds
Surface Flatness:	λ/10
Surface Quality:	10 – 5 scratch and dig
Coating Requirement:	R < 0.25% @1064nm (side surfaces)

Note:

Standard sized product: ϕ(3 ~5) × (40 ~130) mm 1at% Nd:YAG in stock with short lead time.

Finish Machining Processing(for reference only)

Diameter Tolerance	± 0.05mm(standard); ± 0.02mm(special)
Length Tolerance	± 0.75mm(standard); ± 0.25mm(special)
Conical Tolerance	± 0.015mm(standard); ± 0.01(special)
Ovality Tolerance	± 0.01mm(standard), ± 0.01mm(special)
Cylinder Scratch-Dig	280# fine grind(standard); 80-50 polish(special)
Perpendicularity	< 5m (standard); < 2 (special)
Parallelism	< 10s (standard)
Flatness	λ /4 (standard); λ /10 (special)
Surface quality	20-10(standard); 10-5(special)
Coating	R<0.25% per surface @ 1064nm

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