

Nd:YVO₄



DESCRIPTION

Nd-doped YVO₄ crystal is an excellent laser crystal for making the diode-pumped solid lasers. The main and greatest advantages of Nd: YVO₄ are high absorption coefficient, big stimulated emission cross-section and wide absorption band, the absorption peak is about 808 nm. Because of these advantages, small crystal can be used to make smaller laser device. The another feature of Nd: YVO₄ crystal is this uniaxial, which makes it emit linearly polarized lights. Combining with frequency-doubled crystal, all-solid-state lasers with green, blue and red wavelength can be realized.

PARAMETER

Material and Specifications

Materials	Nd: YVO ₄
Concentration Tolerance	0.5%, 1.1%, 2.0%, 3.0%
Orientation	A-cut or C-cut
Parallelism	20"
Perpendicularity	5"
Surface Quality	10/5 Scratch/Dig per MIL-O-13830 B
Wavefront Distortion	< $\lambda/8$ @633nm
Surface Flatness	$\lambda/10$ @ 633 nm
Clear Aperture	>90%
Chamfer	$\leq 0.2\text{mm}@450$
Dimension Tolerance	$(W \pm 0.1\text{mm}) \times (H \pm 0.1\text{mm}) \times (L + 0.2/-0.1\text{mm})$ (L<2.5mm) $(W \pm 0.1\text{mm}) \times (H \pm 0.1\text{mm}) \times (L + 0.5/-0.1\text{mm})$ (L \geq 2.5mm)
Angle Tolerance	$\leq 0.5^\circ$
Damage Threshold[GW/cm ²]	>1 for 1064nm, TEM ₀₀ , 10ns, 10Hz (AR-coated)
Coatings	HR@1064nm+532nm+HT@808nm/AR@1064nm+532nm



Physical and Chemical Properties

Crystal Structure	Zircon Tetragonal, space group D4h-I4/amd
Lattice Constants	a=b=7.12, c=6.29
Density	4.22g/cm ³
Melting Point	1825
Thermal Conductivity	5.2(W·m ⁻¹ ·K ⁻¹ @25°C)
Thermal Optical Coefficient(dn/dT)	dno/dT=8.5×10 ⁻⁶ /K; dne/dT=2.9×10 ⁻⁶ /K
Thermal Expansion / (10 ⁻⁶ ·K ⁻¹ @25°C)	a = 4.43, c= 11.4
Hardness (Mohs)	4~5

Optical and Spectral Properties

Laser Wavelength	1064nm, 1342nm
Polarized Laser Emission	npolarization; parallel to optic axis (c-axis)
Pump Wavelength	808nm
Intrinsic Loss	0.02cm ⁻¹ @1064nm
Diode Pumped Optical to Optical Efficiency	>60%
Emission Cross Section	25×10 ⁻¹⁹ cm ² @1064nm
Fluorescence Lifetime	90 μs (about 50 μs for 2 atm% Nd doped) @ 808 nm
Gain Bandwidth	0.96nm @1064nm
Refractive Index	1.9573(no); 2.1652(ne) @1064nm
	1.9721(no); 2.1858(ne) @808nm
	2.0210(no); 2.2560(ne) @532nm
Absorption Coefficient	31.4 cm ⁻¹ @ 808 nm
Absorption Length	0.32 mm @ 808 nm
Gain Bandwidth	0.96 nm (257 GHz) @ 1064 nm

FEATURES

- High absorption coefficient
- Large stimulated emission cross-section
- Wide absorption bang
- High damage threshold
- Uniaxial crystal
- Good physical and optical property

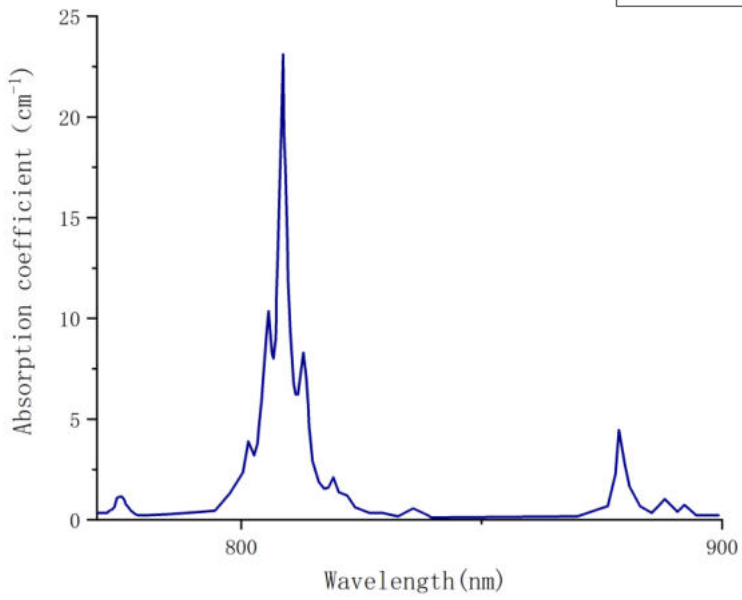
APPLICATIONS

- 457nm laser
- 671nm laser

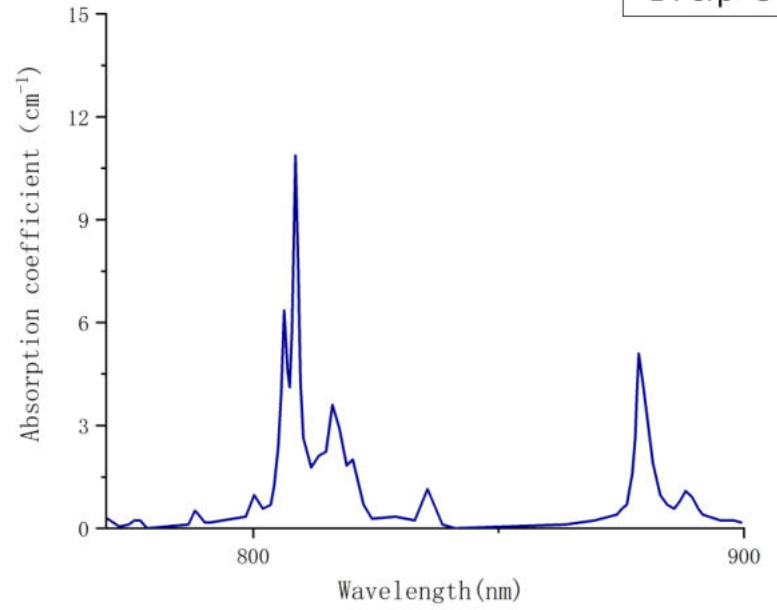


SPECTRA

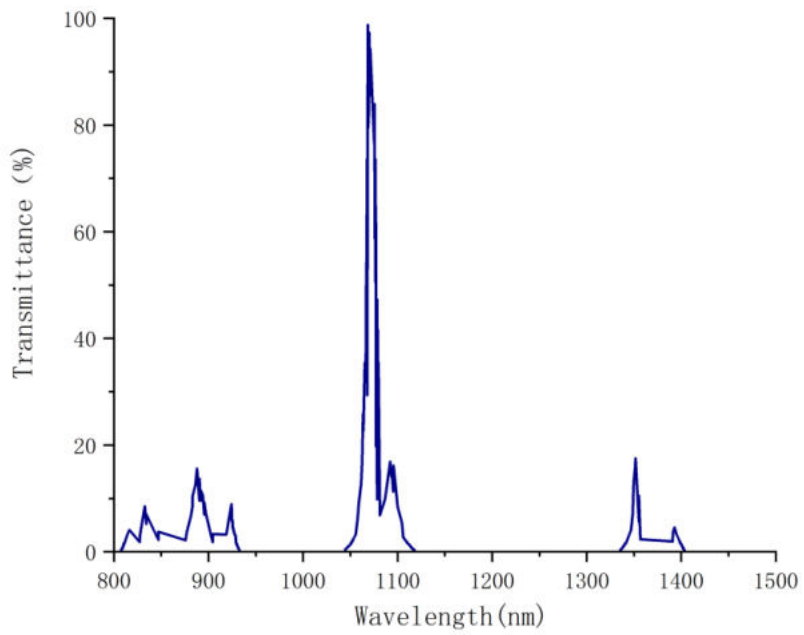
Absorption
E Parallel C



Absorption
E Perp C



Emission
Π Polarization



Emission
σ Polarization

