

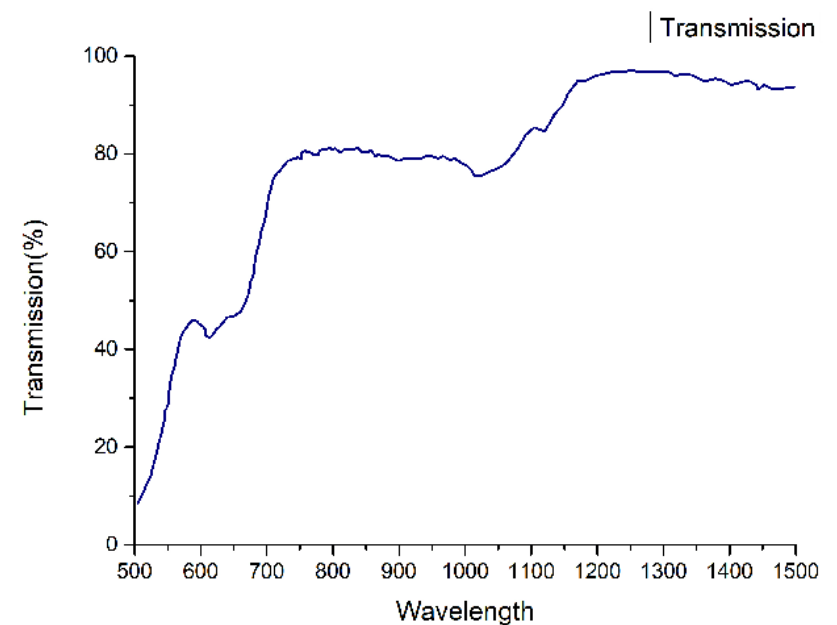
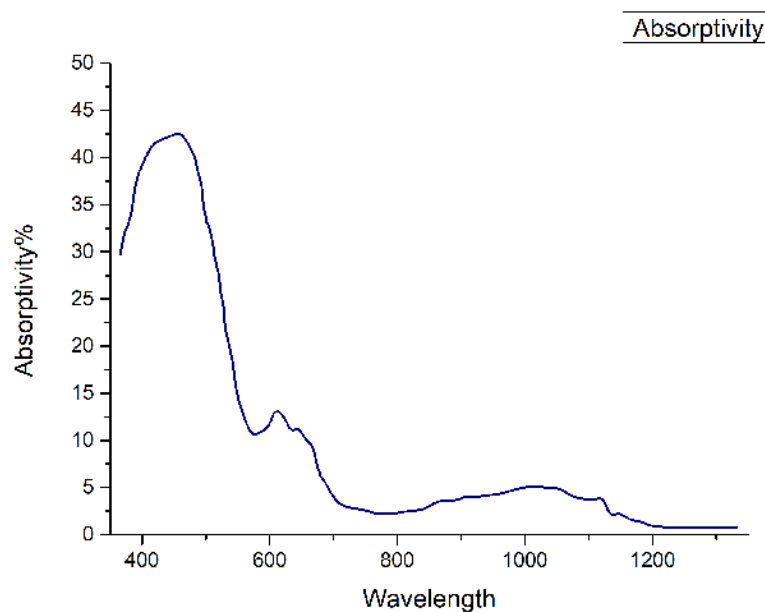
Cr:YAG



DESCRIPTION

Cr⁴⁺:YAG crystal can be used not only as Q-switch but also as gain medium because of its excellent physicochemical properties. The Q-switch operation of pulse and CW Nd:YAG lasers has been realized by using Cr⁴⁺:YAG as Q-switch, and the CW tunable and self-mode-locked operation has also been realized by using Cr⁴⁺:YAG as gain medium. Compared with the traditional saturable absorber, Cr:YAG is superior to the traditional saturable absorber in many aspects. The doping concentration of Cr⁴⁺ ion in Cr⁴⁺:YAG is as high as 10¹⁸ cm⁻³, which can effectively reduce the size of passive Q-switch elements. It is beneficial to achieve high optical conversion efficiency, integration, and compact passive Q-switch laser.

SPECTRA



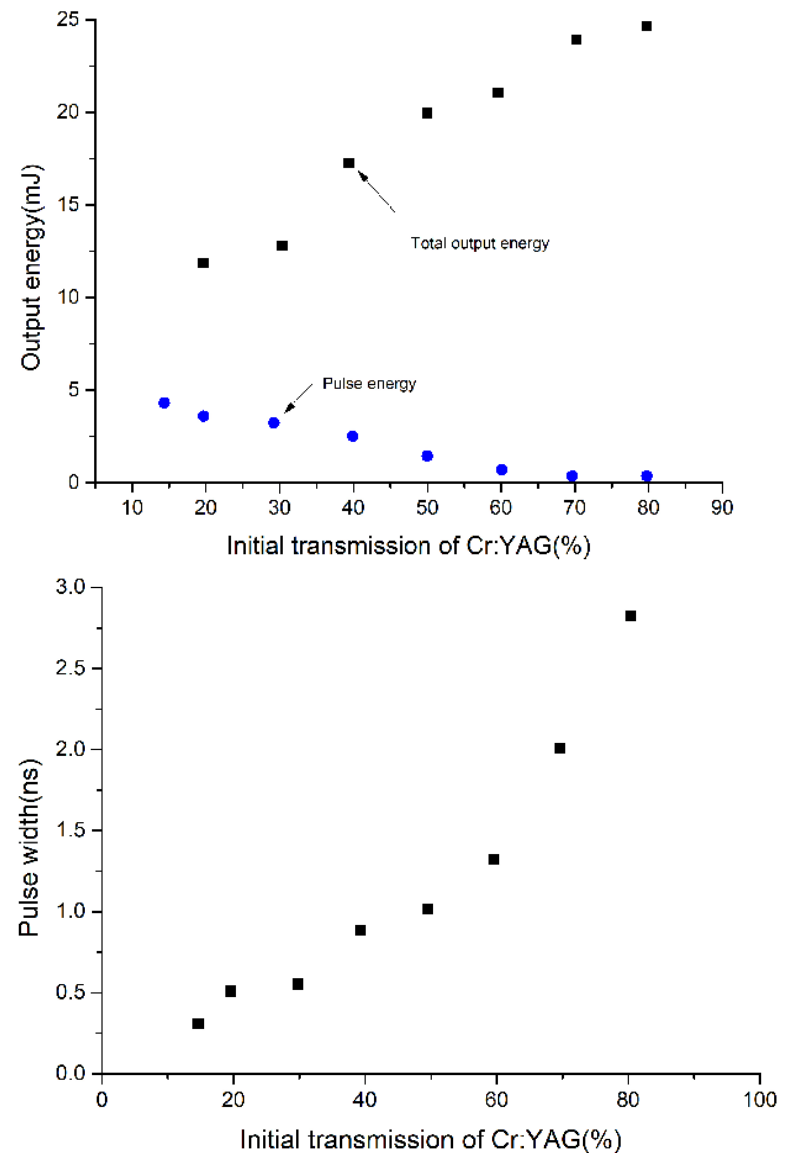
PARAMETER

Physical and Chemical Properties

Property	Value
Chemical formula	Cr ⁴⁺ :Y ₃ Al ₅ O ₁₂
Crystal structure	cubic - Ia3d
Lattice parameters, Å	12.01
Orientation	[100] or [110] < ±0.5°
Mass density	4.56 g/cm ³
Mohs hardness	8.5
Young's modulus	335 GPa
Tensile strength	2 GPa
Melting point	1970°C
Thermal conductivity	0.1213
Specific Heat/ (J·g ⁻¹ ·K ⁻¹)	0.59
Thermal Expansion /(10 ⁻⁶ /°C@25°C)	7.8 <111>
	7.7 <110>
	8.2 <100>
Thermal shock resistance parameter	800 W/m
Extinction Ratio	25dB
Poisson Ratio	0.25
Refractive Index @1064 nm	1.83
Charge compensating ion	Ca ²⁺ , Mg ²⁺

Optical Properties

Property	Value
Optical Density	0.1 to 0.8
Fluorescence lifetime	3.4μs
Concentrations	0.5 mol % ~ 3 mol %
Emission wavelength	1350 nm ~ 1600 nm
Absorption Coefficient	1.0 cm ⁻¹ ~ 7 cm ⁻¹
Ground state absorption cross section	4.3×10 ⁻¹⁸ cm ²
Emission state absorption cross section	8.2×10 ⁻¹⁹ cm ²
Transmission	10% to 90%
Coatings	AR ≤ 0.2% @1064nm
Damage Threshold	> 500 MW / cm ²



Polishing

Property	Value
Orientation Tolerance	< 0.5°
Thickness/Diameter Tolerance	±0.05 mm
Surface Flatness	<λ/8@632 nm
Wavefront Distortion	<λ/4@632 nm
Surface Quality	10-5
Parallel	10"
Perpendicular	5'
Clear Aperture	>90%
Chamfer	<0.1×45°
HR coating	≤ 0.2% (@ 1340nm)
Maximum dimensions	2*2-15*15 mm×20mm

