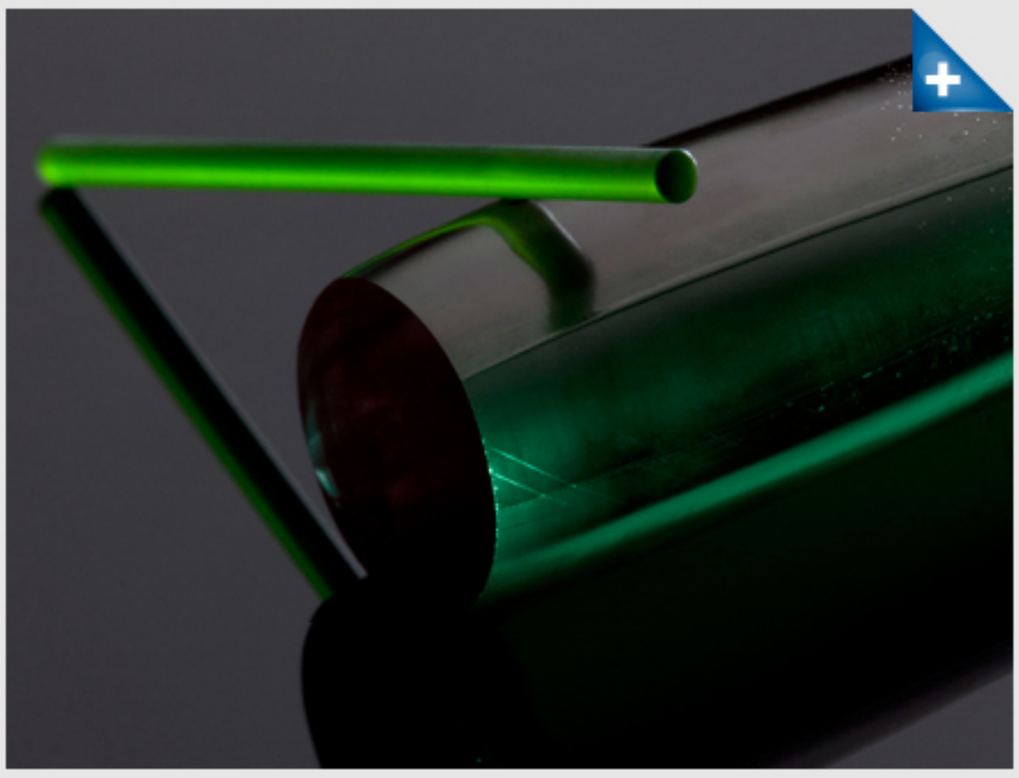
SCIENTIFIC MATERIALS CORP.
A FLIR Systems Company

Laser Materials CTH:YAG



General Information

Triple doped Cr^{3+},Tm^{3+}, Ho^{3+}:YAG is an efficient solid-state laser medium for 2097nm generation, widely used in military, medicine, and remote sensing applications. High spectral overlap of pump radiation (lamp or diode) with the Cr^{3+} and Tm^{3+} absorption bands, and a highly efficient conversion from the absorption bands into the $^5I_7$ -> $^5I_8$ Ho^{3+} emission band, enables 2 micron laser architectures with high quantum efficiency. [1], [2]

SMC provides high quality CTH:YAG for your prouction and/or development efforts.

Contact us with your specific requirements or for availability and pricing.

Dopant Ion

Cr3+ Concentration	0.85%
Tm3+ Concentration	5.9%
Ho3+ Concentration	0.36%

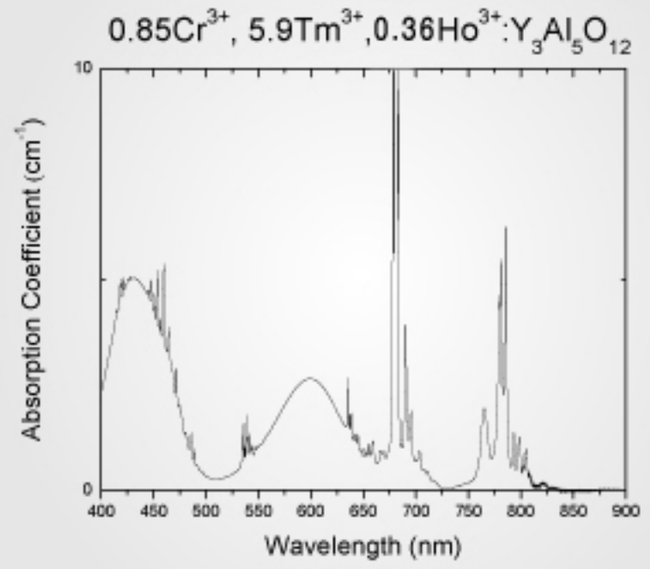
Common Operating Specs

Emission Wavelength	2.080 µm
Laser Transition	$^5I_7 \rightarrow {}^5I_8$
Flouresence Lifetime	8.5 ms
Pump Wavelength	flash lamp or diode pumped @ 780nm

Physical Properties

Coefficient of Thermal Expansion	$6.14 \times 10^{-6}\ K^{-1}$
Thermal Diffusivity	$0.041\ cm^2\ s^{-2}$
Thermal Conductivity	$11.2\ W\ m^{-1}\ K^{-1}$
Specific Heat (Cp)	$0.59\ J\ g^{-1}\ K^{-1}$
Thermal Shock Resistant	$800\ W\ m^{-1}$
Refractive Index @ 632.8 nm	1.83
dn/dT (Thermal Coefficient of Refractive Index) @ 1064nm	$7.8\ 10^{-6}\ K^{-1}$
Molecular Weight	$593.7\ g\ mol^{-1}$
Melting Point	1965°C
Density	$4.56\ g\ cm^{-3}$
MOHS Hardness	8.25
Young's Modulus	335 Gpa
Tensile Strength	2 Gpa
Crystal Structure	Cubic
Standard Orientation	<111>
Y3+ Site Symmetry	D_2
Lattice Constant	a=12.013 Å

Absorption Coefficient Chart



References

1) CTH:YAG was initially suggested by, B. M. Antipenko, et. al. , Zh. Tekh. Fiz. Pis'ma, 11, 682 (1985)

2) An overview of the cross relaxation energetics is given by, A. A. Kaminskii, "Crystalline Lasers: Physcial Processes and Operating Schemes", CRC Press, New York, (1996), ISBN 0-8493-3720-8. Chapter 8.2.

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