

Laser Crystals

NLO Crystals

Birefringent Crystals

AO and EO Crystals

Titanium Doped Sapphire Crystal (Ti: Sapphire)

Introductions



Titanium doped Sapphire (Ti:Sapphire) is the most widely used laser crystal for widely tunable and ultrashort pulsed lasers with high gain and power outputs. we possesses the advanced growth method of Temperature Gradient Technique (TGT), and it supplies large-sized (Dia.30x30mm) Ti:Sapphire crystal in high quality free of light scatter, with the dislocation density less than 10^2cm^{-2} . The TGT grown sapphire crystal is characterized by the (0001) oriented growth, high doping level ($\alpha_{490} = 4.0\text{cm}^{-1}$), high gain and laser damage threshold.

Basic Properties

Items	Specification
Chemical formula	$\text{Ti}^{3+}:\text{Al}_2\text{O}_3$
Crystal structure	Hexagonal $a=4.758$, $c=12.991$
Lattice constants	$a=4.758$, $c=12.991$
Density	3.98 g/cm^3
Melting point	2040°C
Mohs hardness	9mols, 1525-2000Knoop
Thermal conductivity	52 W/m/k
Specific heat	$0.42\text{ W}\cdot\text{s/g/k}$
Laser action	4-Level Vibronic
Fluorescence lifetime	$3.2\mu\text{s}$ (T=300K)
Tuning range	660 - 1050 nm
Absorption range	400 - 600 nm (peak at 490nm)
Emission peak	795 nm
Absorption peak	488 nm
Refractive index	1.76 @ 800 nm
Peak Cross-section	$3\text{-}4 \times 10^{-19}\text{cm}^2$
Thermal Expansion	$8.40 \times 10^{-6}/^\circ\text{C}$

Standard Specification

Items	Specification
Orientation	Optical axis C normal to rod axis
Ti_2O_3 concentration	0.06 - 0.26 at. m%
Figure Of Merit(FOM):	100~250 (>250 available on special requests)
α_{490}	$1.0\text{-}4.0\text{cm}^{-1}$
Diameter	2~30mm or specified
Path Length	2~30mm or specified
End configurations	Flat/Flat or Brewster/Brewster ends
Flatness	$<\lambda/10$ @ 633 nm
Parallelism	<10 arc sec
Surface Quality	Scratch and dig 40-20
Wavefront distortion	$\lambda/4$ per 25 mm

Ti: Sapphire

Crystal

Ti: Sapphire 01