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Ti:Sapphire Crystal (Titanium Doped Sapphire)

Ti:Sapphire crystal is the most widely used tunable solid-state laser material combining the supreme physical and optical properties with the extremely broad lasing range. Its lasing bandwidth can support pulses < 10fs making it the crystal of choice for femtosecond mode-locked oscillators and amplifiers. The absorption band of Ti:Sapphire centers at ~ 490 nm so it may be conveniently pumped by various laser sources such as argon ion lasers or frequency doubled Nd:YAG, Nd:YLF, Nd:YVO4 lasers at ~ 530nm.

Applications

• The tunable wavelengths that cover a broad range from 700 to 1000 nm make Ti:Sapphire an excellent substitute for dye lasers in many applications.

• Doubling by NLO crystals such as BBO in an ultra-thin, Ti:Sapphire can be used to generate UV and DUV (up to 193 nm) laser with ultrafast pulses below 10fs.

• Ti:Sapphire is also widely usedas the pump source of OPOs to expand the tunable range.

Basic Properties

Chemical formula	Ti^{3+}:Al2O3
Crystal structure	Hexagonal a=4.758, c=12.991
Density	3.98 g/cm^3
Melting point	2040^oC
Mohs hardness	9
Thermal conductivity	52 W/m/K
Laser action	4-level vibronic
Fluorescence lifetime	3.2 μs (T=300K)
Tuning range	660 - 1050 nm
Absorption range	400 - 600 nm
Emission peak	795 nm
Absorption peak	488 nm
Refractive index	1.76 @ 800 nm

HGO offer Ti:sapphire specifications:

Orientation:	Optical axis C normal to rod axis
Ti2O3 concentration:	0.06 - 0.5wt %
Figure Of Merit (FOM):	150~250 Upon customers request
End configurations:	Flat/Flat or Brewster/Brewster ends
Flatness:	l /8 @ 633 nm
Parallelism:	10 arc sec
Surface finishing:	10/5 scratch/dig to MIL-O-13830A
Wavefront distortion:	l /4 per inch