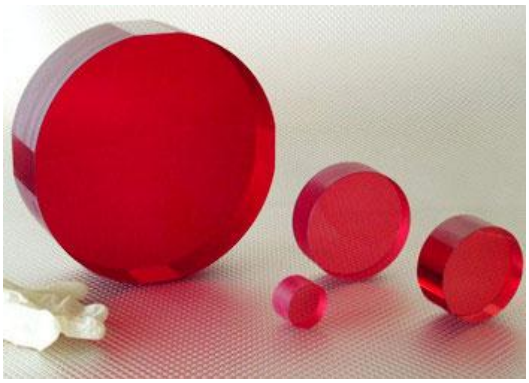
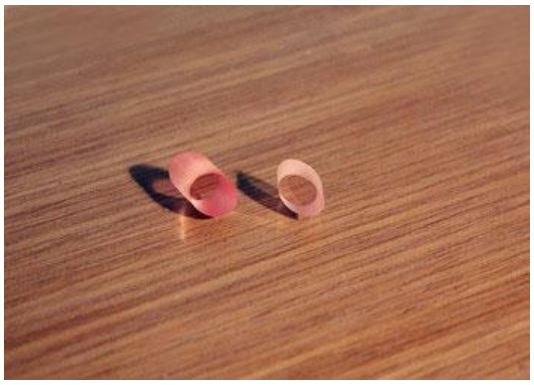
Ti:Sapphire Crystals

Titanium doped Sapphire (Ti:Sapphire) is the most widely used laser crystal for widely tunable and ultrashort pulsed lasers with high gain and high power outputs. The **Ti:Sapphire crystals** of ShalomEO is grown by the method of Temperature Gradient Technique (TGT), the large-sized (Dia.30x 30mm) Ti:Sapphire crystal in high quality free of light scatter, with the dislocation density less than 102cm-2 could be provided. The TGT grown sapphire crystal is characterized by the (0001) oriented growth, high doping level (a490= 4.0cm-1), high gain and laser damage threshold.





SPECIFICATIONS

Specifications	
Orientation	Optical axis C normal to rod axis
Ti2O3 concentration	0.06 - 0.26atm %
Figure Of Merit(FOM)	100~200
α490	1.0-4.0cm^{-1}
Diameter	2-30mm or specified
Path Length	2-30mm or specified
End configurations	Flat/Flat or Brewster/Brewster ends
Flatness	<λ/10 @ 633 nm
Parallelism	<10 arc sec
Surface finishing	<20/10scratch/dig to MIL-PRF-13830B
Wavefront distortion	<λ/4 per inch

Note: The AR Coating is available upon request.

Addr. Room A1031, Boke Mansion, No.9 Xiyuan Road, Xihu District, Hangzhou 310030, China.
Tel:+86-571-87920630 Fax:+86-571-87603342 E-mail:sales@shalomeo.com Home:www.shalomeo.com

Physical and optical properties	
Chemical formula	Ti^{3+}: Al2O3
Crystal structure	Hexagonal
Lattice constants	a=4.758, c=12.991
Density	3.98 g/cm3
Melting point	2040℃
Mohs hardness	9
Thermal conductivity	52 W/m/k
Specific heat	0.42 J/g/k
Laser action	4-Level Vibronic
Fluorescence lifetime	3.2μs (T=300K)
Tuning range	660 - 1050 nm
Absorbtion range	400 - 600 nm
Emission peak	795 nm
Absorption peak	488 nm
Refractive index	1.76 @ 800 nm
Peak Cross-section	3-4x10-19cm2
thermal Expansion	8.40x10-6/℃

Application Notes

- 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 used as the pumping source of OPOs greatly to expand the tunable range.

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