KTP

DESCRIPTION

$KTiOPO_4$ (KTP) has a high nonlinear coefficient (about 15 times that of KDP), high thermal conductivity (twice that of BDN crystal), a wide range of allowable temperature matching and allowable angle matching, a high threshold of resistance to gray traces and light damage, no moisture absorption and deliquescence, no decomposition below 900°C, good mechanical properties, easy polishing of the crystal surface, and small mismatch. Its frequency doubling efficiency for 1064 nm can reach about 80%, and the crystal can be used to make components for frequency doubling, frequency mixing, electro-optical modulation, optical parametric oscillation and optical waveguide.

FEATURES

- High temperature resistance
- High thermal conductivity
- The mismatch is small
- The impedance ratio is large
- Broad band of light transmission
- Low temperature sensitivity
- Good mechanical properties
- Large nonlinear optical coefficient
- Chemical and mechanical properties are stable
- High photoelectric coefficient and low dielectric constant

APPLICATIONS

- Laser ranging for frequency doubling and OPO applications
- Solid-state lasers such as neodymium-doped crystals are mixed to obtain blue light output
- Double frequency of neodymium-doped crystal laser to obtain green/red light output
- OPG, OPA and OPO obtain dimming in the range of 0.6um-4.5um

KTP

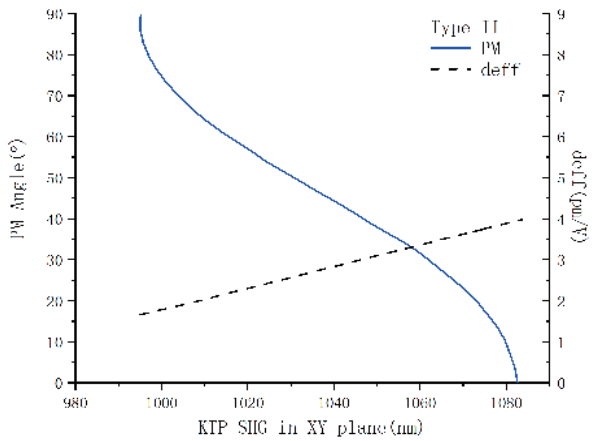
PRODUCT PARAMETERS

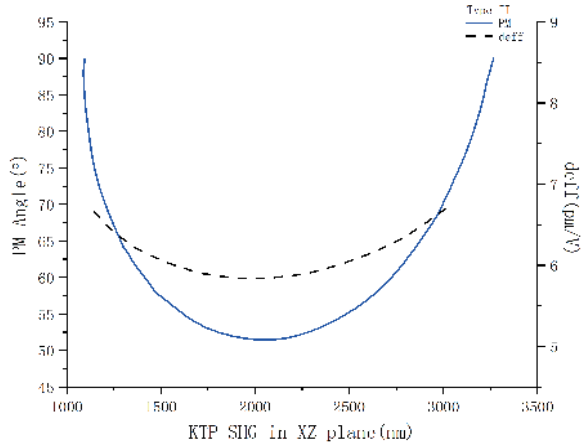
Attributes	Numerical value
chemical formula	$KTiOPO_4$
Crystal structure	Orthorhombic, space group Pna21, point group mm2
Lattice parameters	a=6.404Å, b=10.616Å, c=12.814Å, Z=8
melting point	About 1172°C
Moh's hardness	5
density	3.01 g/cm^3
Thermal Conductivity	13W/m/K
Thermal expansion coefficient	a_x=11x10^{-6}/℃, a_y=9x10^{-6}/℃, a_z=0.6x10^{-6}/℃

NONLINEAR OPTICAL PROPERTIES

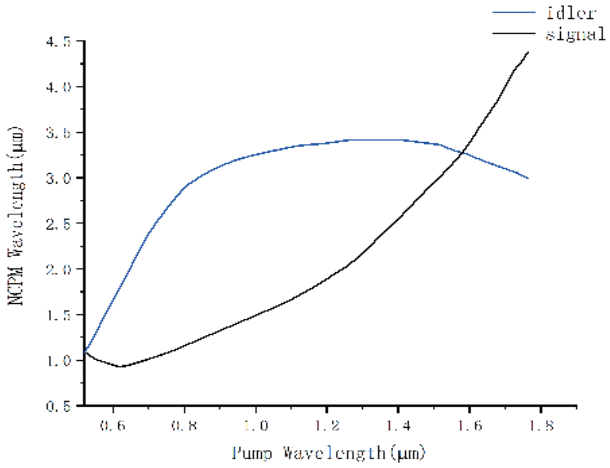
Damage Threshold: [GW/cm]	>0.5 @1064 nm,TEM$_{00}$, 10ns,10HZ(AR-coated)
	>0.3 @532 nm,TEM$_{00}$, 10ns,10HZ(AR-coated)
SHG phase matching range	497 ~ 1800nm (Type II)
Non-vanished nonlinear susceptibility	deff(II)≈(d_{24}- d_{15})sin^{2}φsin^{2}θ- (d_{15}sin^{2}φ+ d_{24}cos^{2}φ)sinθ
	d_{31}=6.5 pm/V
	d_{24}=7.6 pm/V
	d_{32}= 5 pm/V
	d_{15}=6.1 pm/V
	d_{33}=13.7 pm/V
Thermo-optic coefficient	dn_x/dT=1.1*10^{-5}/℃
	dn_y/dT=1.3*10^{-5}/℃
	dn_z/dT=1.6*10^{-5}/℃
For Type II SHG of a Nd:YAG laser at 1064nm	Temperature reception: 24°C cm
	Spectral acceptance: 0.56nm·cm
	Angle reception: 14.2mrad·cm (φ); 55.3mrad·cm(θ)
	Discrete angle: 0.55°

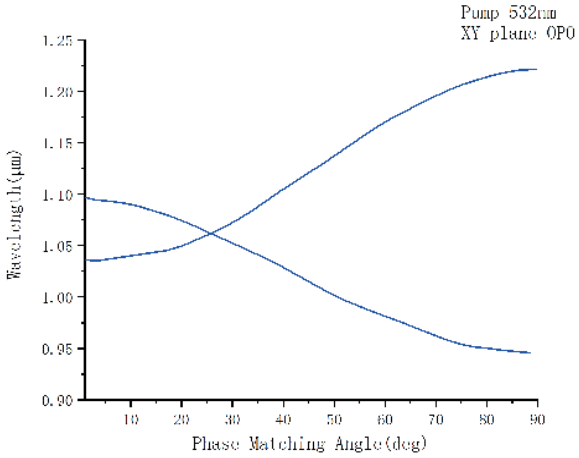
SPECTRA

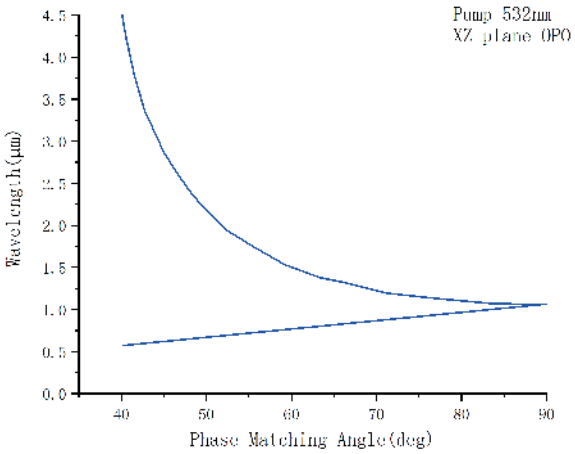




KTP


idler
signal
NCPM Wavelength(μm)
Pump Wavelength(μm)


Pump 532nm
XY plane OPO
Wavelength(μm)
Phase Matching Angle(deg)


Pump 532nm
XZ plane OPO
Wavelength(μm)
Phase Matching Angle(deg)