KTA - Potassium Titanyl Arsenate ($KTiOAsO_4$)

Introduction

Potassium Titanyl Arsenate ($KTiOAsO_4$ or KTA) is an excellent nonlinear optical crystal for Optical Parametric Oscillation (OPO) application. It has better non-linear optical and electro-optical coefficients, significantly reduced absorption in the 2.0-5.0 μm region, broad angular and temperature bandwidth, low dielectric constants. And its low ionic conductivity results in higher damage threshold compared with KTP.

CASTECH offers KTA

- Crystal length from 0.1mm to 30 mm and size up to 10 × 10 × 30 mm^3
- AR-coating from visible to 3300 nm
- Re-polishing, re-coating service
- Fast delivery (15 working days for polished only, 20 working days for AR-coated)

Table 1. Chemical and Structural Properties

Crystal Structure	Orthorhombic, Point group mm2
Lattice Parameter	a = 13.125 Å, b = 6.5716 Å, c = 10.786 Å
Melting Point	1130 ℃
Mohs Hardness	Near 5 Mohs
Density	3.454 g/cm^3
Thermal Conductivity	K1: 1.8 W/m/K; K2: 1.9 W/m/K; K3: 2.1 W/m/K

Table 2. Optical and Nonlinear Optical Properties

Transparency Range	350-5300 nm				
Absorption Coefficients	<0.05%/cm at 1064 nm <0.05%/cm at 1533 nm <5%/cm at 3475 nm				
NLO Susceptibilities	d_{31} = 2.76 pm/V d_{32} = 4.74 pm/V d_{33} = 18.5 pm/V d_{15} = 2.3 pm/V d_{24} = 3.2 pm/V				
Sellmeier Equation $N_i^2=A_i+B_i\lambda^2/(\lambda^2 - C_i^2) - D_i\lambda^2$ (λ in μm)	index	A	B	C	D
	n_x	1.90713	1.23522	0.19692	0.01025
	n_y	2.15912	1.00099	0.21844	0.01096
	n_z	2.14768	1.29559	0.22719	0.01436
Electro-optic Constants (low frequency)	r_{33} = 37.5 pm/V; r_{23} = 15.4 pm/V; r_{13} = 11.5 pm/V				
SHG Phase Matchable Range	1083-3789 nm				