# Potassium Titanyle Arsenate($KTiOAsO_4$, KTA)

## Introduction

Potassium Titanyle Arsenate($KTiOAsO_4$), or KTA crystal, 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 conductivities result in higher damage threshold compared with KTP .

## CASTECH offers KTA

- Crystal length from 0.1mm to 30mm and size up to 10x10x30mm
- AR-coating from visible to 3300nm
- Re-polishing, re-coating service
- Fast delivery(10 working days for polished only, 15 working days for AR-coated)

**Table 1. Basic properties**

| | |
|---|---|
| Crystal Structure | Orthorhombic, point group mm2, |
| Lattice parameter | a=13.125Å, b=6.5716Å, c=10.786Å |
| Melting point | 1130 °C |
| Mohs Hardness | near 5 |
| Density | 3.454g/cm$^3$ |
| Thermal conductivity | K1:1.8W/m/K; K2: 1.9W/m/K; K3: 2.1W/m/K |

**Table 2. Optical and Nonlinear Optical Properties**

| | | | | | |
|---|---|---|---|---|---|
| Transparency Range | 350-5300nm | | | | |
| Absorption Coefficients | @ 1064 nm <0.05 %/cm<br>@ 1533 nm <0.05 %/cm<br>@ 3475 nm <5%/cm | | | | |
| NLO susceptibilities (pm/V) | $d_{31}$ = 2.76, $d_{32}$ = 4.74, $d_{33}$ = 18.5 , $d_{15}$ = 2.3, $d_{24}$ = 3.2 | | | | |
| Sellmeier Equation<br>$N_i^2=A_i+B_i\lambda^2/(\lambda^2-C_i^2)-D_i\lambda^2$<br>(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-optical constants (pm/V)<br>(low frequency) | $r_{33}$=37.5; $r_{23}$=15.4; $r_{13}$=11.5 | | | | |
| SHG Phase Matchable Range | 1083-3789nm | | | | |