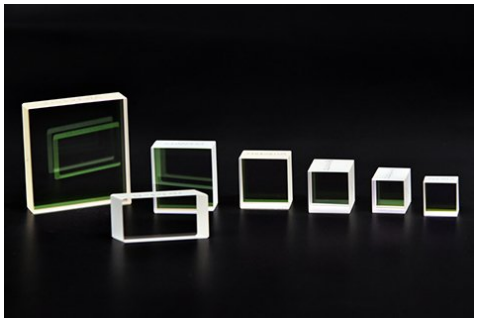
KTA (KTiOAsO4) Nonlinear Crystal for Mid-IR and Eye-Safe OPO, 350–5300 nm

Model WQ-NLC-KTA · waveqvanta.com/products/kta-potassium-titanyl-arsenate-crystal

Potassium titanyl arsenate (KTiOAsO4, KTA) is an orthorhombic nonlinear crystal used mainly in optical parametric oscillators and amplifiers. Compared with KTP, it has lower absorption in the 2.0–5.0 µm region, larger nonlinear and electro-optic coefficients, lower birefringence and lower ionic conductivity. It is typically used as an OPO/OPA medium for output around 3 µm and for eye-safe OPOs at high average power.



Key features

- Transparency range 350–5300 nm
- Reduced absorption in the 2.0–5.0 µm region (< 5%/cm at 3475 nm)
- Nonlinear coefficient d33 = 18.5 pm/V
- Electro-optic coefficient r33 = 37.5 pm/V (low frequency)
- Lower birefringence than KTP, giving smaller walk-off
- Low ionic conductivity, giving a higher damage threshold than KTP
- AR-coating damage threshold above 10 J/cm^2 at 1064 nm for 10 ns pulses
- AR coatings with low absorption at 3 µm available

Specifications

Chemical Formula	KTiOAsO4
Crystal Structure	Orthorhombic, point group mm2
Lattice Parameters	a = 13.125 Å, b = 6.5716 Å, c = 10.786 Å
Melting Point	1130 °C
Mohs Hardness	≈ 5
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
Transparency Range	350–5300 nm
Absorption Coefficients	< 0.05%/cm at 1064 nm; < 0.05%/cm at 1533 nm; < 5%/cm at 3475 nm
Nonlinear Coefficients	d31 = 2.76 pm/V, d32 = 4.74 pm/V, d33 = 18.5 pm/V, d15 = 2.3 pm/V, d24 = 3.2 pm/V
Electro-Optic Coefficients (Low Frequency)	r33 = 37.5 pm/V; r23 = 15.4 pm/V; r13 = 11.5 pm/V
SHG Phase-Matching Range	1083–3789 nm
AR Coating Damage Threshold	> 10 J/cm^2 at 1064 nm, 10 ns pulses

Standard sizes

Size	Cut / orientation	Surface / coating	Mount
8 × 8 × 1.5 mm	θ = 39.4°, φ = 0°	Blank	—
10 × 10 × 30 mm	θ = 90°, φ = 0°	Polished, uncoated	—
10 × 8 × 5 mm	θ = 58°, φ = 0°	Polished, uncoated	—
10 × 8 × 2 mm	θ = 58°, φ = 0°	Polished, uncoated	—
8 × 8 × 2.5 mm	θ = 45°, XZ plane	AR/AR @ 1030 + 1800 + 2407.8 nm	Mounted
8 × 8 × 3 mm	θ = 45°	AR/AR @ 1030 + 1800 + 2407.8 nm	Mounted

Size	Cut / orientation	Surface / coating	Mount
10 × 10 × 0.5 mm	θ = 39.4°, φ = 0°	S1: HT @ 800 nm + 2.5–5 µm; S2: HT @ 600–1000 nm	Mounted

Typical applications

- OPO and OPA for mid-infrared output around 3 µm
- Eye-safe OPOs at high average power
- Mid-IR OPA and difference-frequency setups pumped by 1030 nm or 800 nm ultrafast lasers
- Second harmonic generation of fundamentals between 1083 nm and 3789 nm