

Potassium Titanyl Arsenate - $KTiOAsO_4$

Advantages

- High efficiency
- Small walk-off
- High transmission in the 3-3.5 μm range

Operation

- X-cut Signal wavelength : 1.54 μm
- OPO range : 1.51-3.5 μm

Application

- Eye-safe instruments
(target designators, range finders)
with mid-high average powers
- Spectroscopy, gas detection



Specifications

Aperture cut	tolerance +/-0.1mm
Length	tolerance +0.3/-0.2mm
Parallelism	30 arcsec
Perpendicularity	30 arcmin
Flatness ($\lambda=633\text{nm}$)	better than $\lambda/6$
Orientation	+/-0.5 deg.
Roughness	better than 10 Å RMS
Scratch/dig	10-5

Thin Film Coatings

Technologies available	PVD, IAD, IBS
Damage threshold	500 MW/cm ² AR-coated, at 10 Hz, 10 ns
AR coatings	better than 0.1% (0.05% on request) at 1064nm, 0.25% at 532nm

Physical Properties

Chemical formula	KTiOAsO ₄		
Crystal structure	Orthorhombic		
Point group	mm2		
Lattice parameters, Å	a	b	c
	13.12	6.56	10.79
Hardness (Mohs)	5.5		
Hygroscopic susceptibility	none		
Density, g.cm⁻³	3.45		
Ionic conductivity (room temperature, 10 kHz), S.cm⁻¹	10 ⁻⁶		
Aperture, mm²:	up to 10 x 10		
Length, mm:	up to 20		

Optical Properties

Average refractive index

1.8

Coefficients in Sellmeier's equation

$$\left[n_i^2 = A_i + \frac{B_i \lambda^2}{(\lambda^2 - C_i^2)} - D_i \lambda^2 \right]$$

for 0.4 < λ < 4 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	2.14786	1.29559	0.22719	0.01436

Fenimore, Schepler, Ramadabran, McPherson,
J. Opt. Soc. Am. B Vol 12(5) 1995

Transparency range, μm

0.35 → 5.3

Residual absorption (Photo-thermal Common-path Interferometer): 200 ppm/cm at 1064nm