

ZGP



DESCRIPTION

Zinc Phosphor Germanium (ZnGeP₂, or ZGP) crystals are positive uniaxial crystals. It is one of the most commonly used nonlinear crystals for optical parametric oscillator (OPO) technology, ZGP crystal has a large effective nonlinear coefficient (d_{eff} =75 pm/V, several or tens of times more than other commonly used nonlinear crystals), high damage threshold (>30GW/cm²), wide transmission band (0.74~12.4 µm), small absorption coefficient (absorption coefficient of 2~3µm less than 0.04cm⁻¹), high thermal conductivity (360mW/cm·K), stable performance, and mature fabrication process. It has many advantages such as the ability to grow large size crystals. It is an ideal crystal for OPO in the mid-infrared of 3~5m band.

FEATURES

- Large nonlinear coefficient
- $\bullet\,$ The transmission region is 74 μm to 12 μm
- The relative damage threshold is high
- High thermal conductivity
- Wide transparent area
- Phase matching over a wide spectral range

NONLINEAR OPTICAL PROPERTIES

APPLICATIONS

- Pulse selector
- Optical parametric oscillation
- Electro-optic Q switch
- Laser power/phase modulation

Attribute	~ Numerical
SHG Phase Matching Range	3177 10357nm (Type I)
	d ₃₆ =75 ± 8 pm/V
NLO Coefficient	Type I d _{eeo} =d ₃₆ sin2θcos2φ
	Type II $d_{oeo}=d_{eoo}=d_{36}sin\thetasin2\phi$
Damage Threshold	
At 2.79 um	30 GW/cm ² (150 ps)
At 10.6 um	1 GW/cm ² (2 ns)



Building 7, No.718 Baoqi Road, Baoshan District, Shanghai, China



ZGP PHYSICAL AND CHEMICAL PROPERTIES

Attribute	Numerical
Chemical Formula	ZnGeP ₂
Crystal Structure	Tetragonal Crystal System,42m
Lattice Constant	a=b=5.467Å, c=12.736Å
Mass Density	4.16 g/cm3
Mohs Hardness	5.5
Melting Point	About 1040°C
Thermal Conductivity	180 W/m/K
Coefficient of Thermal Expansion	β∥,5×10 ⁻⁶ /K; β⊥,7.8×10 ⁻⁶ /K
Birefringence	Single Shaft

LINEAR OPTICAL PROPERTIES

Attribute	Numerical
Transparent Range	0.74 – 12 um
Absorption Coefficient	a<0.05cm ⁻¹ @2050-2100 nm
Refractive Index	
@ 2.05µm	n _o = 3.1478, n _e = 3.1891
@ 2.79µm	n _o = 3.1333, n _e = 3.1744
@ 5.30µm	n _o = 3.1136, n _e = 3.1547
@ 10.6µm	$n_o = 3.0729, n_e = 3.1143$
Sellmeier Equation (λ in μ m) -	$n_0^2(\lambda) = 4.64467 + 5.10087/(\lambda^2 - 0.13656) + 4.27777\lambda^2/(\lambda^2 - 1653.89)$
	$n_e^2(\lambda) = 4.71539 + 5.26358/(\lambda^2 - 0.14386) + 2.37310\lambda^2/(\lambda^2 - 1000.82)$

SPECTRA











www.crylink.com sales@crylink.com +86-21-66566068

Building 7, No.718 Baoqi Road, Baoshan District, Shanghai, China