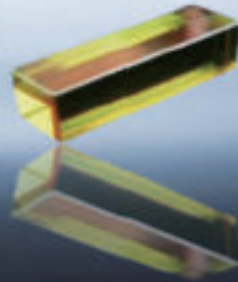


AgGaS₂



DESCRIPTION

AgGaS₂ (Silver Gallium Sulfide, AGS) crystal is a typical I-III-VVI₂ chalcopyrite structure compound semiconductor, light yellow at room temperature, crystal infrared transparency range is wide, non-linear coefficient is large, has a large birefringence (~ 0.054), energy gap of 2.75eV, high quality factor, high threshold of optical damage, can be used for second harmonic generation, and frequency, optical parametric oscillation, etc. In particular, AgGaS₂ crystal as a parametric upconversion device can achieve 90° non-critical phase matching at room temperature, and can convert infrared light in the 10.2~11.6 μm band to 0.566 μm green light in the range of 0~100°C. These are of great importance for applications of remote sensing, ranging and spectroscopic measurements with tuned CO₂ lasers as detection light sources.

AgGaS₂ crystal is a new type of advanced infrared nonlinear optical material with excellent performance, which has important research value and application prospects in the fields of infrared detection, infrared remote control, infrared monitoring, laser communication and national defense, science and technology.

APPLICATIONS

- CO₂ lasers
- Frequency mixing for the mid-infrared region from 4.0 to 18.3 μm
- Frequency doubling devices for output 10.6μm CO₂ lasers
- OPO and OPG devices for use in 1um lasers
- Frequency mixing for YAG lasers titanium gem lasers and various fiber ultrashort pulse lasers

FEATURES

- Low light absorption
- High conversion efficiency
- Wide transmittance range
- Large nonlinear optical coefficients
- Low scattering short wavelength transmission



AgGaS₂

MACHINING PARAMETERS

Orientation accuracy	<±0.1°
Surface finish	20/10 per MIL-O-13830A
Facial form	λ/8@632.8nm for T>=1mm
Tolerance of smooth surface	+0/-0.1mm
Length tolerance	±0.1mm
Parallelism	30 "
verticality	10'
Chamfering	<0.2mm×45°

BASIC PERFORMANCE

chemical formula	AgGaS ₂
Transmission range	0.47 - 13μm
crystal structure	Tetragonal system
lattice constant	a=5.756Å, c=10.301 Å
density	4.48g/cm ³
Mohs hardness	3.0 - 3.5
Nonlinear coefficient @10.6 μ m, pm/V	d ₃₆ = 12.5 pm/V
melting point	993°C
absorption coefficient	<0.05 cm ⁻¹ @ 1.064 μm <0.02 cm ⁻¹ @ 10.6 μm
Negative single crystal axis	n _o >n _e (n _e >n _o when λ<0.497μm)
Thermal conductivity	1.0 W/M/°C
SHG phase matching	1.8-11.2 μm
Damage threshold @10 ns, 1.064 um	30 MW/cm ² (surface)
Coefficient of thermal expansion	C: -8.1 x 10 ⁻⁶ /°C ⊥C: +19.8 x 10 ⁻⁶ /°C
Thermooptic coefficient	dn _o /dt=15.4 x 10 ⁻⁵ /°C dn _e /dt=15.5 x 10 ⁻⁵ /°C
Sellmeier equation (λ in μ m)T=20°C	n _o ² =3.3970+2.3982λ ² /(λ ² - 0.09311) +2.1640 λ ² / (λ ² -950) n _e ² =3.5873+1.9533λ ² /(λ ² - 0.11066) + 2.3391λ ² /(λ ² - 1030.7)
band gap	2.7eV
Birefringence	0.0231@0.53 μm
	0.0504@0.694 μm
	0.0542@1.06 μm
	0.0533@5.3 μm
	0.0542@10.6 μm



AgGaS₂

SPECTRA

