

# CdSe



## DESCRIPTION

Cadmium selenide (CdSe) crystals are III- V cluster compound semiconductors with wide infrared transparent band (0.75~25  $\mu\text{m}$ ), large nonlinear coefficient ( $d_{31}=18 \text{ pm/V}$ ) and suitable birefringence, meanwhile, CdSe crystals also have the advantages of good chemical stability, no deliquescence, moderate mechanical strength and good processing performance, and can be frequency converted in the infrared band, which is a kind of performance CdSe crystals also have the advantages of good chemical stability, deliquescence, mechanical strength and good processing performance. It can be used to prepare infrared nonlinear optical devices.

## FEATURES

- Wide transmittance range
- very nonlinear
- small walk-off angle
- low light absorption
- good mechanical properties
- small departure angle
- Broadband specific transmission range: 1.6 $\mu\text{m}$  to 2.5 $\mu\text{m}$  high laser damage threshold

## APPLICATIONS

- led
- DFM frequency converter
- Optical Parametric Oscillator (OPG)
- IR polarizing optics: IR polarizers and IR waveplates.
- IR optics: IR beam splitters, IR dichroic mirrors and IR windows
- Nanoparticles (e.g. nano AWS, nanotubes and nanowires)



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## PHYSICOCHEMICAL PROPERTIES

structure	Hexagonal system, 6mm
density	5.81 g/ cm <sup>3</sup>
Young's modulus	5×10 <sup>11</sup> dyne/cm <sup>2</sup>
Coefficient of thermal expansion (500 K)	a <sub>1</sub> =6.26×10 <sup>-6</sup> /K;a <sub>3</sub> =4.28×10 <sup>-6</sup> /K
specific heat	0.49 J/gK
Thermal conductivity (@ 25 °C)	0.04 W/cm K
Maximum transmittance (λ= 2.5-15μm )	≥ 71 %
Absorption coefficient (λ= ten point six μm )	≤ 0.0015 cm <sup>-1</sup> (including 2 surfaces)
Refractive index (λ=ten point six μm )	2.4258 (n <sub>o</sub> ), 2.4437 (n <sub>e</sub> )
CelmeierMethod@T=293 K(λin μm)	$\frac{n_o^2=4.2243+1.7680\lambda^2/(\lambda^2-0.2270)+3.1200\lambda^2/(\lambda^2-3380)}{n_e^2=4.2009+1.8875\lambda^2/(\lambda^2-0.2171)+3.6461\lambda^2/(\lambda^2-3629)}$
Mohs hardness	3.25
damage threshold	60MW/cm <sup>2</sup> @10.6μm , 200 ns
Transparent range	0.7-24μm
Optical symmetry	Positive uniaxial (n <sub>e</sub> >n <sub>o</sub> )
Lattice parameters	a=4.2985, c=7.0150
resistivity	Low resistance: < 1 ohm*cm High resistance: > 10 <sup>11</sup> ohm*cm
Thermal conductivity (@ 25 °C)	6,9 (  c) Wm <sup>-1</sup> K <sup>-1</sup> , 6,2 (⊥c) Wm <sup>-1</sup> K <sup>-1</sup>

## SPECTRA

