

ZINC SELENIDE CRYSTALS [ZnSe]

Zinc Selenide is used for optical windows, lenses, mirrors and prisms particularly for infrared applications. The transmission range is 0.5 μm - 22 μm. Used for high power CO₂-laser optics at 10.6 microns Zinc Selenide is produced by synthesis from zinc vapour and H₂Se gas, forming as sheets on graphite susceptors. It is microcrystalline in structure, the grain size being controlled to produce maximum strength. Single crystal ZnSe is available, but is not common but has been reported as having lower absorption and thus more effective for CO₂ optics.



Specification

Transmission Range	0.6 to 21.0μm
Refractive Index	2.4028 at 10μm
Reflection Loss	29.1% at 10.6μm [2 surfaces]
Absorption Coefficient	0.0005cm ⁻¹ at 10.6μm
Reststrahlen Peak	45.7microns
dn/dT	+61 × 10 ⁻⁶ /°C at 10.6μm at 298K
dn/dμ = 0	5.5μm
Density	5.27g/cm ³
Melting Point	1525°C [dissociates about 700°C]
Thermal Conductivity	18 W/ [mK] at 298K
Thermal Expansion	7.1 × 10 ⁻⁶ / °C at 273K
Hardness	Knoop 120 with 50g indenter
Specific Heat Capacity	339 J · kg ⁻¹ · K ⁻¹
Bulk Modulus [K]	40 GPa
Young's Modulus [E]	67.2 GPa
Apparent Elastic Limit	55.1 MPa [8,000psi]
Poisson Ratio	0.28