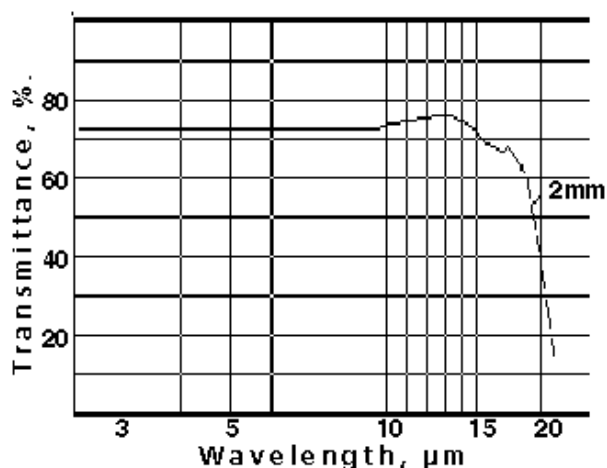


Zinc Selenide (ZnSe)



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 vapor 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 also available.

OPTICAL PROPERTIES

Transmission Range	0.6 to 21.0 microns
Refractive Index	2.4028 at 10 microns
Reflection Loss	31.11% at 10.6 μm (2 surfaces)
Index of Absorption	0.0005 cm ⁻¹ at 10.6 microns
Reststrahlen Peak	45.7 microns
dN/dT	+61 x 10 ⁻⁶ /°C at 10.6μm at 298K
dN/dμ = 0	5.5μm

PHYSICAL PROPERTIES

Density	5.27 g/cm ³
Melting Point	1525°C (dissociates about 700°C)
Thermal Conductivity	18 Wm ⁻¹ K ⁻¹ at 298K
Thermal Expansion	7.1 x 10 ⁻⁶ /°C at 273K
Hardness	Knoop 120 with 50g indenter
Specific Heat Capacity	339 J kg ⁻¹ K ⁻¹
Young's Modulus (E)	67.2 GPa
Bulk Modulus (K)	40 GPa
Apparent Elastic Limit	55.1 MPa (8,000psi)
Poisson Ratio	0.28

CHEMICAL PROPERTIES

Solubility	0.001 g/100g water
Molecular Weight	144.33
Class/Structure	HIP polycrystalline cubic, ZnS, F43m

Wavelength, μm	2.75	5.00	7.50	9.50	11.0	12.5	13.5
Refractive Index	2.44	2.43	2.42	2.41	2.40	2.39	2.38
Wavelength, μm	15.0	16.0	16.9	17.8	18.6	19.3	20.0
Refractive Index	2.37	2.36	2.35	2.34	2.33	2.32	2.31