



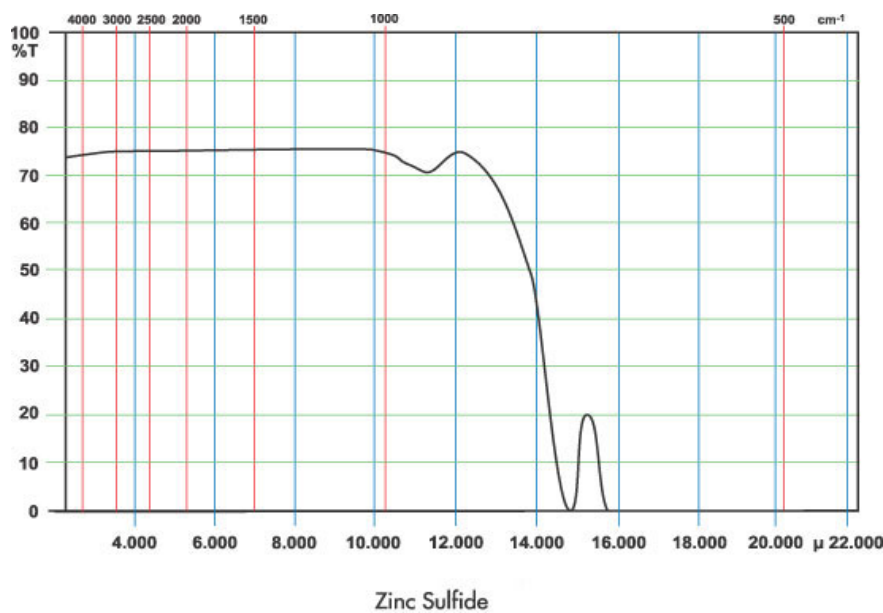
KNIGHT OPTICAL

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Title: Optical Material / Crystals (Infrared)
Material / Specification: Zinc Sulphide for 0.37 to 13.5 m Transmission
Range / Description: OPM-Zinc Sulphide (Cleartran)

A water-free form of ZnS. Insoluble in water. Also known as Irtran-2. Zinc sulphide is also used as an IF optical material, transmitting from visible wavelengths to over 12 micrometers. It can be used planar as an optical window or shaped into a lens.

Internal Transmittance



Refractive Index n vs. Wavelength λ																
λ , MKM	0.40	0.43	0.48	0.56	0.66	0.78	0.89	1.01	2.05	3.0	4.0	5.0	8.0	10.0	12.0	13.0
n(λ)	2.54	2.49	2.43	2.38	2.34	2.31	2.30	2.29	2.26	2.25	2.25	2.24	2.22	2.20	2.17	2.15

Optical Properties	
Transmission Range	0.37 to 13.5
Refractive Index	2.20084 at 10
Refractive Loss	24.7% at 10
Crystal/Class Structure	HIP polycrystalline cubic, ZnS, F42m
Cleavage Plane	n/a

Thermal Properties	
Thermal Expansion	$6.5 \times 10^{-6} / ^\circ\text{C}$ at 273K
Thermal Conductivity	$27.2 \text{ W m}^{-1} \text{ K}^{-1}$ at 298K
Melting Point	1827°C
Specific Heat Capacity	$515 \text{ J Kg}^{-1} \text{ K}^{-1}$

Mechanical Properties	
Density	4.09 g/cc
Hardness (Knoop)	160 with 50g indenter
Youngs Modulus	74.5 GPa
Shear Modulus	n/a
Bulk Modulus	n/a
Poisson Ratio	0.28
Elastic Limit	68.9 MPa (10,000 psi)
Molecular Weight	144.33

Chemical Properties	
Solubility	$65 \times 10^{-6} \text{ g/100g water}$