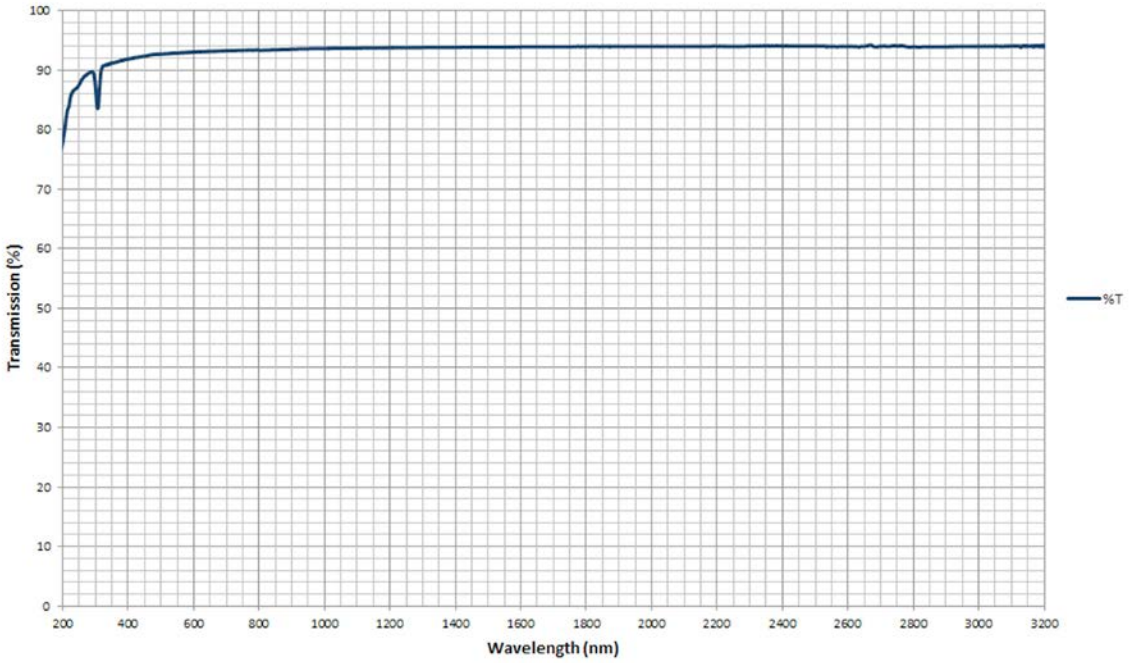
Optical Materials: Infrared

KNIGHT OPTICAL

Title: Optical material/crystals (Infrared)

Material/Specification: Calcium fluoride for 0.13µm to 10 µm tranmission

Range/Description: OPMI-CALCIUM FLUORIDE



Internal Transmittance $t_i(\lambda)$ vs. Wavelength λ											
λ/MKM	**0.2**	**0.5**	**1.0**	**3.0**	**5.0**	**6.0**	**7.0**	**8.0**	**9.0**	**10.0**	**12.0**
t_i (λ)	0.87	0.97	0.99	0.99	0.99	0.98	0.97	0.88	0.59	0.19	-

Refractive Index n vs. Wavelength λ																
λ/MKM	**0.2**	**0.5**	**1.0**	**2.0**	**3.0**	**4.0**	**5.0**	**6.0**	**7.0**	**8.0**	**9.0**	**10**	**11**	**12**	**12.5**	**15**
n(l)	1.49	1.43	1.42	1.42	1.41	1.40	1.39	1.38	1.36	1.34	1.32	1.30	1.26	1.20	-	-

Optical Properties	
Transmission Range	0.13µm to 10µm
Refractive Index	1.39908 at 5µm
Refractive Loss	5.4% at 5µm
Crystal/Class Structure	Cubic CsCl, Pm3m
Cleavage Plane	No cleavage planes

Thermal Properties	
Thermal Expansion	47.9 x 10^{-6} / °C at 273K
Thermal Conductivity	9.71 W m^{-1} K^{-1}
Melting Point	1360°C
Specific Heat Capacity	854 J Kg^{-1} K^{-1}

Mechanical Properties	
Density	3.18g/cc
Hardness (Knoop)	158.3 (100) with 500g indenter
Youngs Modulus	75.8 Gpa
Shear Modulus	33.77 Gpa
Bulk Modulus	82.71 Gpa
Poisson Ratio	0.26
Elastic Limit	C11 = 164 C12 = 53 C44 = 33.7
Molecular Weight	78.08

Chemical Properties	
Solubility	0.0017g/100g water at 20°C