OPTICAL MATERIALS : INFRA-RED

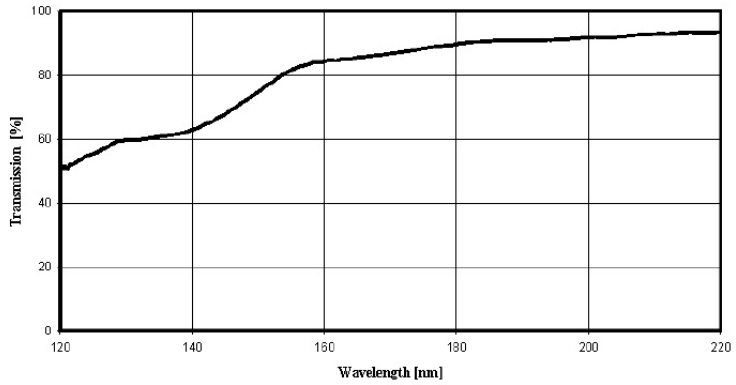
Title: Optical material/ crystals (Infrared)

Material/Specification: Lithium Fluoride for 0.12µm to 6µm transmission

Range/Description: OPMI-LITHIUM FLUORIDE

Lithium fluoride has the most extreme UV transmission and so is used for special UV optics. It transmits well into the VUV region at the hydrogen Lyman-alpha line (121nm) and beyond.

Internal Transmittance



Internal Transmittance $t_i(\lambda)$ vs. wavelength λ											
λ,MKM	0.2	0.5	1.0	3.0	5.0	6.0	7.0	—.	—.	—.	—.
$\tau_i(\lambda)$	0.90	0.98	0.97	0.97	0.88	0.65	0.14	—.	—.	—.	—.

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	—.	—.	—.	—.
n(l)	1.43	1.39	13.8	1.37	1.36	1.34	1.32	1.29	1.26	1.21	1.16	1.10	—.	—.	—.	—.

Optical Properties	
Transmission Range	0.12 to 6 µm
Refractive Index	1.392 at 0.6 µm
Refractive Loss	5.2% at 0.6 µm
Crystal/Class Structure	Cubic FCC, NaCl, Fm3m
Cleavage Plane	(100) cleavage

Thermal Properties	
Thermal Expansion	37 x 10^{-6} K^{-1} at 283 K
Thermal Conductivity	58.61 W m^{-1} K^{-1} at 293K
Melting Point	936 °C
Specific Heat Capacity	310 J Kg^{-1} K^{-1}

Mechanical Properties	
Density	5.33 g/cc
Hardness (Knoop)	102 with 600g indenter
Youngs Modulus	64.97 GPa
Shear Modulus	55.14 GPa
Bulk Modulus	62.03 GPa
Poisson Ratio	0.326
Elastic Limit	11.2 MPa (1620 psi)
Molecular Weight	25.94

Chemical Properties	
Solubility	0.27g / 100g water at 20 °C

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