

Calcium fluoride (CaF₂)



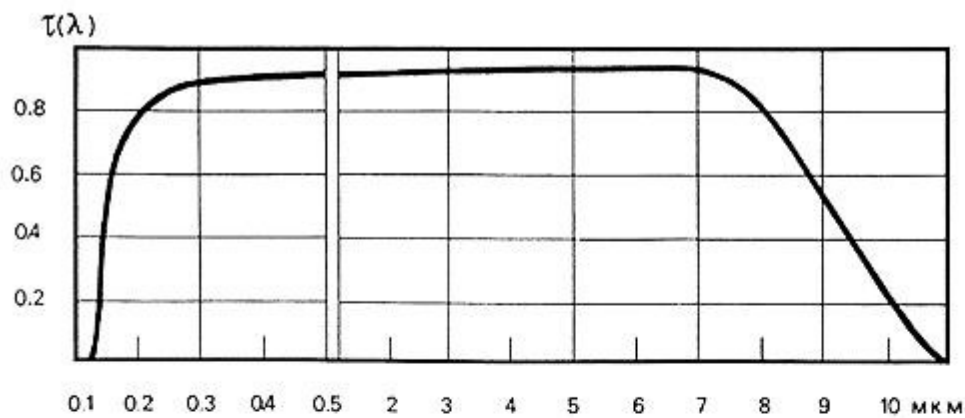
1. Crystallographic characteristics

Crystal system group	Class	Lattice parameters		Cleavage
		a	c	
Cubic	m 3 m	5,462	a	Perfect along (111)

2. Optical characteristics

n _e	n _{F'} - n _{C'}	n _{10,5}	n _{8,0} - n _{12,5}	Internal transmittance coefficient		Refractive index	
				l, mkm	τ _i (1)	l, mkm	n (1)
1,4349	0,0043	1,2996	-				
Attenuation coefficient α (1), cm ⁻¹ , less than						0,2	1,4951
						0,5	1,4365
						1,0	1,4289
						2,0	1,4239
						3,0	1,4179
						4,0	1,4098
						5,0	1,3990
						6,0	1,3856
						7,0	1,3693
						8,0	1,3498
						9,0	1,3268
						10,0	1,3002
						11,0	1,2676
						12,0	1,2299
Thermal coefficient of refractive index at $\lambda = 3,39$ mkm, 10 ⁻⁵ °C ⁻¹ in range of ± 60°C							
(-0,95) - (-1,17)							
Transparency range, mkm (10 mm width)							
0,15 - 9,0							

Transmission spectrum



3. Thermal characteristics

Thermal expansion α_t , $10^8, ^\circ\text{C}^{-1}$	Thermal conductivity, $\text{W}/(\text{m} \cdot ^\circ\text{C})$	Specific heat, $10^3 \text{ J}/(\text{kg} \cdot ^\circ\text{C})$	Heat resistance, $^\circ\text{C}$	Melting Point, $^\circ\text{C}$
in range of $\pm 60^\circ\text{C}$	at 38°C	at 40°C	20 ± 2	1418
$16.2 \div 19.4$	9.71	0.8876		

4. Mechanical characteristics

Density, at 20°C , g/cm^3	Hardness/Mohs	Microhardness, 10^7 Pa		Elastic compliance constants, 10^{-12} Pa^{-1}		
				S ₁₁	S ₁₂	S ₄₄
3.18	4	165		6.83	-1.53	29.58
Modulus of elasticity E, in direction, 10^{10} Pa ,		Shear modulus G, in plane, 10^{10} Pa ,		Transverse deformation coefficient ν		
$\langle 100 \rangle$	$\langle 111 \rangle$	(100)	(111)			
14.61	8.99	4.76	3.38			

Optic stresses coefficient		Photoelastic constants		Piezooptic constants at $n = 0.589 \text{ mkm}, 10^{-12} \text{ Pa}^{-1}$		
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B_1	B_2	C_1	C_2	n_{11}	n_{12}	n_{44}
2.14	-1.03	0.43	-1.71	-0.29	1.16	0.70

5. Chemical stability

Solubility		
in water at 20°C , $\text{g}/100 \text{ cm}^3$	in acids	in organic solvents
0.0016	low soluble	not soluble in acetone