

Potassium Chloride (KCl)

MATERIALS DATA

Potassium Chloride is produced in large ingots by the Kyropoulos growth method. Potassium Chloride cleaves easily. With care Potassium Chloride can be polished to a high standard under humidity controlled conditions.

APPLICATIONS: Potassium Chloride is mainly used for CO₂ laser protection windows as an inexpensive disposable material with a low refractive index.

Transmission Range	0.21 to 20 μ m
Refractive Index	1.45644 at 10 μ m (2)
Reflection Loss	6.7% at 10 μ m
Absorption Coefficient	6.5 x 10 ⁻³ cm ⁻³ at 10.6 μ m @ 300K (6)
Reststrahlen Peak	63.1 μ m
dn/dT	-33.2 x 10 ⁻⁶ K ⁻¹ (1)
dn/d μ = 0	n/a
Density	1.99 g/cc
Melting Point	776°C
Thermal Conductivity	6.53 W m ⁻¹ K ⁻¹ at 322K (3)
Thermal Expansion	36 X 10 ⁻⁶ K ⁻¹ at 300k
Hardness	Knoop 7.2 <110>, 9.3 <100> with 200g (4)
Specific Heat Capacity	690 J Kg ⁻¹ K ⁻¹
Dielectric Constant	4.64 at 1MHz at 300K
Youngs Modulus (E)	29.67 GPa (4)
Shear Modulus (G)	6.24 GPa (4)
Bulk Modulus (K)	17.36 GPa (4)
Elastic Coefficients	C ₁₁ =39.8; C ₁₂ =6.2; C ₄₄ =6.25 (5)
Rupture Modulus	4.4 MPa (635 psi) (4)
Poisson Ratio	0.216
Solubility	34.7g/100g water
Molecular Weight	74.55
Class/Structure	Cubic FCC, NaCl, Fm3m, (100) cleavage

(1) Mentzel; Z. Physik. V 88, p178. 1934

(2) H.H.Li; RI of Alkali Halides. J. Phys and Chem Reference Data V5(2), p421, 1976

(3) Ballard, McCarthy & Davis; Rev. Sci. Insts, V21, p905, 1970

(4) Combes, et.al.; J.Opt. Soc. Am. V41, p215, 1951.

(5) Galt; Phys.Rev. V36, p1460, 1948

(6) H.H.Li, Absorption Coefficients, Int.J.Therm, V1, No. I, 1980



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μm	No	μm	No	μm	No
0.185	1.8271	0.200	1.7187	0.251	1.5897
0.308	1.54136	0.410	1.50907	0.509	1.4962
0.671	1.48669	0.883	1.48142	0.982	1.4800
1.179	1.47831	2.357	1.47475	2.947	1.47383
3.536	1.47305	4.715	1.47112	5.000	1.47048
6.000	1.46842	7.000	1.466	8.000	1.4629
9.000	1.46002	10.00	1.45644	11.00	1.45244
12.00	1.44801	13.00	1.44313	14.00	1.43779
15.00	1.43197	16.00	1.42563	17.00	1.41877
18.00	1.41134	19.00	1.40333	20.00	1.39469
21.00	1.38538	22.00	1.37537	23.00	1.36461
24.00	1.35303	25.00	1.34059	26.00	1.32721
27.00	1.31281	28.00	1.29731		

