KRS5 Thallium Bromo-Iodide (TlBr-TlI)

CAUTION: Thallium salts are considered TOXIC and should be handled with care.

KRS5 crystallises by the sealed-ampoule Stockbarger technique. Starting materials of the highest purity are selected to ensure that there are no anionic absorption bands between 2µm and 16µm and all crystals are checked for quality by using a pathlength of 120mm.

APPLICATIONS: KRS5 is a deep IR material with a high refractive index, KRS5 is used extensively in spectroscopy for ATR prisms, windows and lenses. In conjunction with Germanium, KRS5 can also be used in thermally compensated IR imaging systems.

Transmission Range	0.6 to 40µm
Refractive Index	2.371 at 10µm (1) (3)
Reflection Loss	28.4% at 10µm (2 surfaces)
Absorption Coefficient	n/a
Reststrahlen Peak	n/a
dn/dT	$-235 \times 10^{-6}\ K^{-1}$
dn/dµ = 0	7µm
Density	7.371 g/cc (3)
Melting Point	414.5°C (3)
Thermal Conductivity	$0.544\ W\ m^{-1}\ K^{-1}$ at 293K
Thermal Expansion	$58 \times 10^{-6}\ K^{-1}$ (2)
Hardness	Knoop 40.2 (2)
Specific Heat Capacity	$200\ J\ Kg^{-1}\ K^{-1}$ at 273K
Dielectric Constant	32.5
Youngs Modulus (E)	15.85 GPa (2)
Shear Modulus (G)	5.79 GPa (2)
Bulk Modulus (K)	19.78 GPa (2)
Elastic Coefficients	C_{11}=331; C_{12}=13.2; C_{44}=5.79
Apparent Elastic Limit	26.2 MPa (2)
Poisson Ratio	0.369
Solubility	0.05g/100g water at 293K
Molecular Weight	42 mole% TlBr; 58 mole% TlI
Class/Structure	Cubic, CsCl structure, Pm3m, (#221) No cleavage (3)

(1) Rodney and Malitson J.Opt Soc.Am. V46, p 956, 1953
(2) Combes, Ballard, McCarthy: J.Opt Soc.Am. V41, p 215, 1951
(3) Handbook of Optical Constants, ed Palik, V3, ISBN 0-12-544423-0

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µm	No	µm	No	µm	No
0.54	2.68059	1.00	2.44620	1.50	2.40774
2.00	2.39498	3.00	2.38574	4.00	2.38204
5.00	2.37979	6.00	2.37797	7.0	2.37627
8.0	2.37452	9.0	2.37267	10.0	2.37069
11.0	2.36854	12.0	2.36622	13.0	2.36371
14.0	2.36101	15.0	2.35812	16.0	2.35502
17.0	2.35173	18.0	2.34822	19.0	2.34451
20.0	2.34058	21.0	2.33643	22.0	2.33206
23.0	2.32746	24.0	2.32264	25.0	2.31758
26.0	2.31229	27.0	2.30676	28.0	2.30098
29.0	2.29495	30.0	2.28867	31.0	2.28212
32.0	2.27531	33.0	2.26823	34.0	2.26087
35.0	2.25322	36.0	2.24528	37.0	2.23705
38.0	2.22850	39.0	2.21965	40.0	2.21047