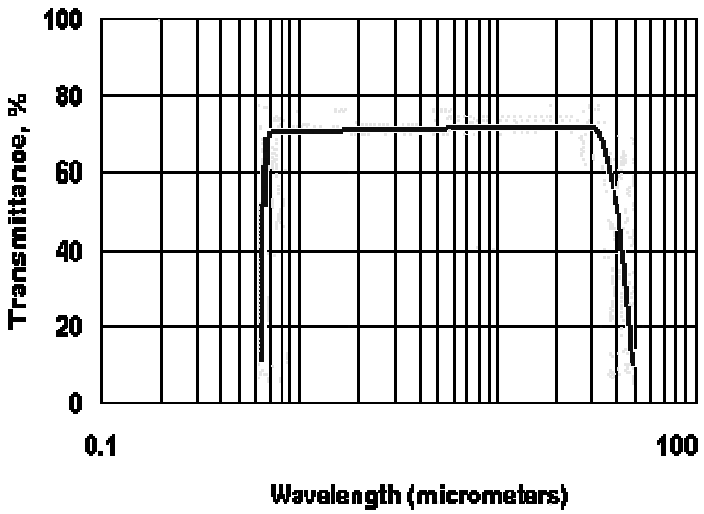
Tallium Bromide-Iodide (KRS-5)



KRS-5 is used for attenuated total reflection prisms, IR windows and lenses where transmission in the 0.6 µm - 40 µm range is desired. It has a tendency to cold-flow and change its shape with time. KRS-5 is only slightly soluble in water but can be dissolved in alcohol, nitric acid, and aqua regia. This material is considered toxic and should be handled with care.

OPTICAL PROPERTIES

Transmission Range	**0.6 to 40 microns**
Refractive Index	2.37069 at 10 microns
Reflection Loss	30,3% at 10 µm (2 surfaces)
Restrahlen Peak	135 microns
dN/dT	-235 X 10-6/°C

PHYSICAL PROPERTIES

Density	7.371 g/cm^3
Melting Point	414.5°C
Thermal Conductivity	0.544W/(m∗K) at 20°C
Thermal Expansion	58? 10^{-6}/°C
Hardness	Knoop 40.2 kg/mm^2
Specific Heat Capacity	200 J/(kg? K) at 0°C
Dielectric Constant	32.5
Young's Modulus (E)	15.85 GPa
Shear Modulus (G)	5.79 GPa
Bulk Modulus (K)	19.78 GPa
Elastic Coefficients	C_{11} = 33.1 C_{12} = 13.2 C_{44} = 5.79
Apparent Elastic Limit	26.2 MPa
Poisson Ratio	0.369

CHEMICAL PROPERTIES

Solubility	0.05g/100g water at 20°C
Molecular Weight	42 mole % TlBr: 58 mole % TlI
Class/Structure	Cubic, CsCl structure. No cleavage planes

Wavelength, µm	0.540	1.000	1.500	2.000	3.000	4.000	5.000	6.000	7.000
Refractive Index	2.681	2.446	2.408	2.395	2.386	2.382	2.380	2.378	2.376

Wavelength, µm	8.000	9.000	10.00	11.00	12.00	13.00	14.00	15.00	16.00
Refractive Index	2.375	2.373	2.371	2.369	2.366	2.364	2.361	2.358	2.355

Wavelength, µm	17.00	18.00	19.00	20.00	21.00	22.00	23.00	24.00	25.00
Refractive Index	2.352	2.348	2.345	2.341	2.336	2.332	2.327	2.323	2.318

Wavelength, µm	26.00	27.00	28.00	29.00	30.00	31.00	32.00	33.00
Refractive Index	2.312	2.307	2.301	2.295	2.289	2.282	2.275	2.268

Wavelength, µm	34.00	35.00	36.00	37.00	38.00	39.00	40.00	
Refractive Index	2.261	2.253	2.245	2.237	2.228	2.220	2.210	