

SELECTION GUIDE FOR INFRARED TRANSMITTING MATERIALS

Materials		Transmission Range	Index of Refraction	
NaCl	Rock Salt	0.25 – 15 μ m	1.52	Generally considered the most useful cell window. NaCl is low cost and rugged. Hygroscopic.
KBr	Potassium Bromide	0.25 – 25 μ m	1.53	KBr is an excellent, low cost material with an extended transmission range. It is softer than NaCl; stands thermal and mechanical shock fairly well. Hygroscopic.
AgCl	Silver Chloride	0.4 – 23 μ m	2.0	Soft material. Darkens under UV radiation, insoluble in water. Used as inexpensive cell windows. Corrosive to metals.
CaF ₂	Calcium Fluoride	0.15 – 9 μ m	1.40	Low index and very low solubility. Makes durable and precise cell for the region in which it transmits. Insoluble in water; resists most acids and alkalides. Do not use with solutions of ammonium salts.
BaF ₂	Barium Fluoride	0.2 – 11.5 μ m	1.46	This material is extremely sensitive to thermal shock. Do not use with solutions of ammonium salts. Insoluble in water; has good resistance to fluorine and fluorides.

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CsI	Cesium Iodide	1.5 – 50 μ m	1.74	Generally easier to handle than cesium bromide. Hygroscopic; does not cleave; easily scratched.
KRS-5	Thallium Bromide-Iodide	0.5 – 35 μ m	2.37	Easily scratched; will cold flow; does not cleave; soluble in bases; insoluble in acids; slightly water soluble. Ideal for ATR work. Do not grind or polish.
ZnSe	Zinc Selenide	1 – 18 μ m	2.4	Material equals KRS-5 in general usefulness. Insoluble in water and highly resistant to most solvents. Strong interference fringes may occur in short path cells. It is brittle and therefore must be handled with extreme care.
MgF ₂	Magnesium Fluoride	0.11 – 7.5 μ m	1.37 – 1.38	Slightly more soluble than CaF ₂ . Birefringent. Transmits from vacuum ultraviolet into the infrared. Sensitive to thermal shock.
Ge	Germanium	2 – 11.5 μ m	4.0	This high index material should prove highly useful for surface studies and perhaps as a process window. It is chemically inert, hard and brittle. Should be handled with extreme care, tends to fracture.

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KCl	Potassium Chloride	0.18 – 20 μ m	1.46	KCl is similar to NaCl, but not as popular. Our choice over NaCl for basic cell material because it is less hygroscopic, transmits further into the infrared range, and resists thermal shock.
ZnS	Irtran-2 Zinc Sulfide	1 – 14 μ m	2.20	Insoluble in water. Slightly soluble in acids, HNO ₃ , H ₂ SO ₄ , and KOH.
SiO ₂	Infrasil Quartz	0.4 – 4 μ m	1.5 at 3333cm ⁻¹	Insoluble in water. Birefringent.



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