OPTICAL MATERIAL PROPERTIES

AMTIR-1 Ge33As12Se55Glass

AMTIR-1 is an amorphous IR transmission material. It was originally produced for night vision systems, but it has other applications including optical elements and optical sensors for remote temperature sensing.

Barium Fluoride (BaF2) Optical Crystals

Barium Fluoride (BaF2) is commonly used as a scintillator material and is useful as a transmission window material for IR spectroscopy particularly for analysis of fuel oil samples. This material is extremely sensitive to thermal shock.

BK-7 Borosilicate Crown Glass

BK-7 is typically used in visible light applications and at 1064nm where, among other things, it is useful as a protective window for YAG lasers.

Cadmium Magnesium Telluride (CdMgTe)

The ternary compound Cadmium Magnesium Telluride (“CdMgTe”) is one of ICL’s newest products. CdMgTe may become the material of choice for room temperature gamma ray detectors. It may also have applications such as light emitting diodes (LED) and epitaxial substrates for thin films.

Cadmium Manganese Mercury Telluride (CdMnHgTe) Magneto Optical Crystals

The quaternary compound Cadmium Manganese Mercury Telluride (“CMHT”) is a magneto-optical material that can be tuned to vary the energy gap and the lattice constant independently.

Cadmium Telluride (CdTe) Optical Crystals

Cadmium Telluride (CdTe) is useful for infrared optical windows, as a solar cell material and as an electro-optic modulator. An early form of CdTe was sold as IRTRAN-6.

OPTICAL MATERIAL PROPERTIES

Calcium Fluoride (CaF2) Optical Crystals

Calcium Fluoride (CaF2) is commonly sold in two (2) grades – IR grade and UV grade. UV grade CaF2 is more expensive. CaF2 is used in lens for cameras, photolithography and IR spectroscopy.

Cesium Iodide (CsI) Optical Crystals

Cesium Iodide is useful for beam splitters for Far IR spectrophotometers, IR transmission windows and scintillator applications.

Fused Silica (SiO2) IR & UV Grade

Fused Silica comes in IR and UV grades. The IR grades are sold under several trademarks, including Infrasil. This material is sometimes referred to by the misnomer crystal quartz. Synthetic crystal quartz is bi-refringent and its applications differ from those of fused silica. The IR grade of this material is useful for IR spectroscopy as a window material for cells and cuvettes.

Germanium (Ge) Optical Crystals

Germanium (Ge) is useful for ATR prisms, CO_2 laser optics, optical coatings for beam splitters and other IR optical applications. This material is somewhat brittle and tends to chip and spall.

Magnesium Fluoride (MgF2) Optical Crystals

Magnesium Fluoride (MgF2) is commonly used for UV windows, lenses and polarizers. It is also useful in its transmission range for some IR spectroscopy applications. Eastman Kodak produced this material in polycrystalline form as Irtran-1® (not to be confused with Irtran-2® which was ZnS).

OPTICAL MATERIAL PROPERTIES

Potassium Bromide (KBr) Optical Crystals

Potassium Bromide is commonly used for infrared transmission windows in gas and liquid sample cells used with infrared and FTIR spectrophotometers and for beam splitters for spectrophotometers. KBr windows are soft and hygroscopic. ICL is the only company in the United States that grows KBr.

Potassium Chloride (KCl) Optical Crystals

Potassium Chloride (KCl) is commonly used for infrared transmission crystal windows in gas and liquid sample cells used with infrared and FTIR spectrophotometers. KCl crystal windows are particularly useful for spatter barrier windows in CO_2 lasers because they have a low refractive index at 10.6 microns and the damage threshold is high. KCl is hygroscopic.

Sapphire (Al2O3) Optical Crystals

Sapphire (Al_2O_3) is an extremely hard material which is useful for UV, NIRand IR applications through 5 microns. It is particularly useful for high pressure and high temperature applications

Silicon (Si) Optical Crystals

Silicon (Si) is commonly used as a window material for far infrared transmission. Although the material has an absorbance edge at about 8 microns, it transmits in the 50 to 100+ micron range, making it a useful alternative to CsI for aqueous samples analyzed by IR spectroscopy. It is also useful for some ATR applications.

Silver Bromide (AgBr) Optical Crystals

Silver Bromide (AgBr) is an orange colored optical material commonly used for infrared transmission windows in gas and liquid sample cells used with infrared and FTIR spectrophotometers.

OPTICAL MATERIAL PROPERTIES

Silver Chloride (AgCl) Optical Crystals

Silver Chloride (AgCl) is commonly used for infrared transmission windows in gas and liquid sample cells used with infrared and FTIR spectrophotometers in place of Potassium Bromide (KBr) with aqueous samples that would attack KBr optics.

Sodium Chloride (NaCl) Optical Crystals

Sodium Chloride is the most common infrared transmission crystal window for gas and liquid sample cells used with infrared and FTIR spectrophotometers.

Thallium Bromoiodide (KRS-5) Optical Crystals

KRs-5 (TlBr-TlI) is a gorgeous red crystal commonly used for attenuated total reflection prisms for IR spectroscopy. It is also used as an infrared transmission window in gas and liquid sample cells used with FTIR spectrophotometers in place of Potassium Bromide (KBr) or Cesium Iodide (CsI) for analysis of aqueous samples that would attack KBr or CsI optics.

Zinc Selenide (ZnSe)

Zinc Selenide (ZnSe) is commonly used for CO_2 laser focusing lenses, night vision applications, ATR prisms and transmission windows for IR spectroscopy.

Zinc Sulfide (ZnS) Optical Crystals

Zinc Sulfide (ZnS) is used as a transmission window for IR spectroscopy. Zinc Sulfide (ZnS) is or has been produced under the trademarks Cleartran® and Irtran® .

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