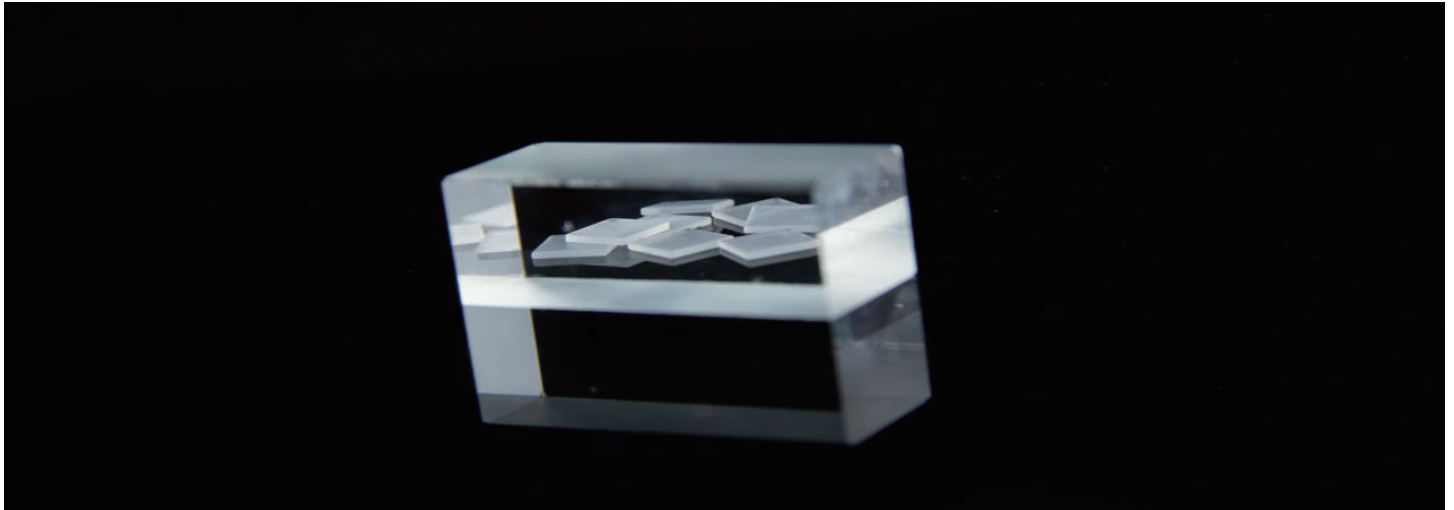


BaF₂/Ce:BaF₂ scintillator crystals



DESCRIPTION

BaF₂ crystal (cerium-doped barium fluoride crystal) is a crystal with the fastest decay time and is widely used in high energy physics experiments, gigahertz hard X ray imaging, and time-of-flight (TOF) positron emission tomography. The fast components of pure BaF₂ crystals are concentrated in the peaks of 195nm and 220nm, and the decay time is about 800ps. In addition, there is a slow component with the peak of the emission spectrum near 310nm, and the decay time is about 600ns. The introduction of cerium ions (Ce³⁺) can effectively suppress slow components and improve the performance of the crystal.

Ce: BaF₂ crystal shows high density of 4.83g/cm³ and with a radiation length of about 2.05cm. The refractive index of BaF₂ is close to that of optical glass, which makes it easier to export light in coupling with the photomultiplier tube. Ce: BaF₂ crystals are widely used in the detection of high-energy particles, such as β-rays and γ-rays.

FEATURES

- Fastest decay time
- High density
- Refractive index matching

APPLICATIONS

- γ-ray detection
- Time-of-flight (TOF) positron emission tomography
- Ionizing radiation detector
- X-ray imaging
- Radiation scintillation screen

PARAMETERS

SCINTILLATOR PROPERTIES

Wavelength (Max.Emission)(nm)	310
Wavelength (nm)	170-460
Decay time (ns)	630(slow);0.87/0.88(fast)
Light output (photons/MeV)	10000(Slow);1900(Fast)
Refractive index	1.49@310nm
Radiation length (cm)	2.026
Optical transmission (um)	0.15- 12.5
Transmittance (%)	>90(0.35-9um)
Reflection loss/surface (%)	6.8
Afterglow (after 3ms)(%)	0.005
Light output relative NAI(Tl)(%)	20(slow),4(fast)

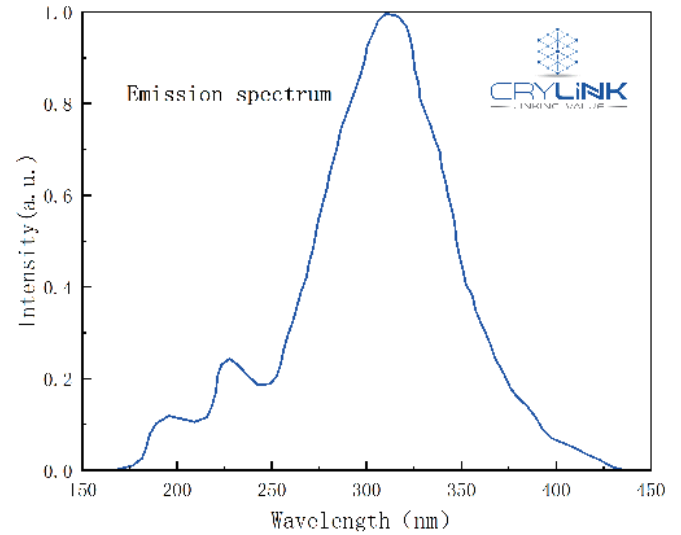


BaF₂/Ce:BaF₂ scintillator crystals

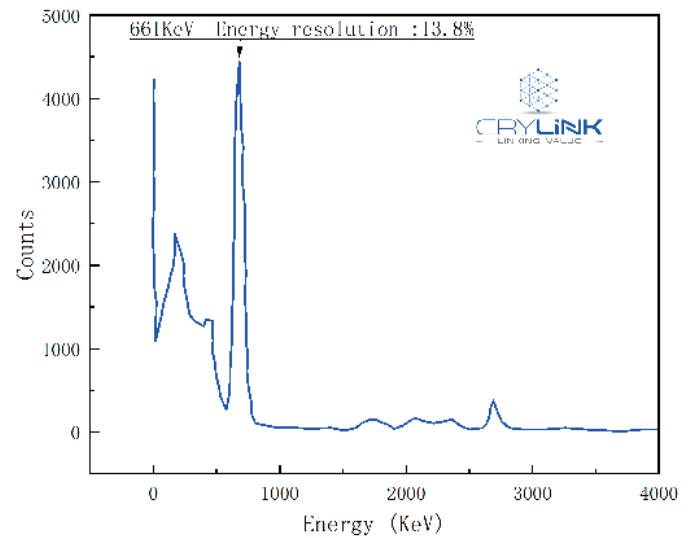
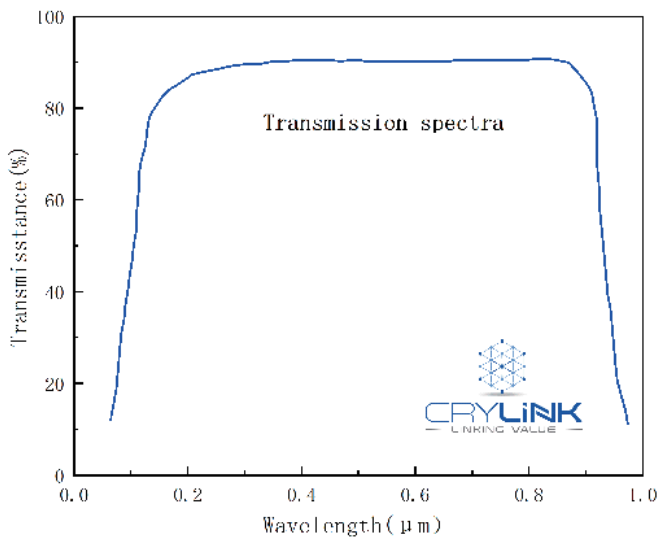
MATERIAL PROPERTIES

Chemical formula	Ce:BaF ₂
Density (g/cm ³)	4.893
Melting point (°C)	1.386
Hardness (Mho)	3
Cleavage	slightly
Lattice Constant	<111>
Solubility (g/100gH ₂ O)	0.6196
Thermal expansion coeff (C ⁻¹)	18.3*10 ⁻⁶
Thermal conductivity coeff (W/mk)	11.72

SPECTRA



SPECTRA



PMT:R1306 ; Reflector: Teflon(0.8mm);
 Radiation source: Cs¹³⁷ HV:650V
 Light Output :10000 ph/MeV;
 Energy resolution :13.8%

