

CeF₃



DESCRIPTION

As a good Faraday rotator single-crystals, cerium fluoride (CeF₃) have attracted much attention in the field of magneto-optics due to their broad applications such as optical isolators. The magneto-optical effects of the Ce ions are known to be caused by the intra-ionic parity allowed electric dipole transition between the 4fN and 4fN-15d1 configurations. These transitions are close to the absorption cut-off in the widely transparent fluorides, which leads to outstanding Verdet constants in the UV wavelength region. It is a good scintillation crystal with high density and short decay time. CeF₃ Crystal is a suitable material in the measurements application of high counting rate, strong absorption irradiation and high time resolution process.

APPLICATIONS

- Optical coating
- Decolorize glass
- Raw material for polishing powder, special glass, metallurgical applications
- Optical isolator, optical nonreciprocal element, magneto-optical memory and magneto-optical modulator, optical fiber communication and integrated optical device, computer storage, logic operation and transmission function, magneto-optical display, magneto-optical recording, new microwave device, laser gyro

FEATURES

- Slightly hygroscopic
- Broad band gap
- Susceptible to thermal shock
- Unique and good transmittance in the UV wavelength region
- Soluble in water and strong mineral acids
- Slightly hygroscopic
- Possesses the fast cross-luminescence component at 195 and 220 nm with a lifetime of several hundred picoseconds



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PARAMETERS

Physical and Chemical Properties

Crystal Structure	Hexagonal
Lattice Constants	6.2001
Specific mass	6.16g/cm ³
Melting Point	1443°C
Thermal Expansion (10 ⁻⁶ ·K ⁻¹ @25°C)	11.5
Cleavage Plane	(0001)

Index of Refraction

$\lambda(\mu\text{m})$	n
0.3	1.7
0.4	1.65
0.5	1.63
0.6	1.62
1	1.6
2	1.59

Optical characteristics

Transmission Range	0.3 ... 11 μm
Reflective Loss	6 ... 16%@0.2 ... 10 μm
Refractive Index	1.62@400nm
Radiation Length/mm	17
Magneto-optical Figure (108·rad·W ⁻¹ /(Tm))	6.5@1075nm
Dielectric Constant	7.33@f=2MHz
Emission Peak/nm	340@slow, 310@fast
Decay Constant/ns	30@slow, 8@fast
Light Output	0.086

