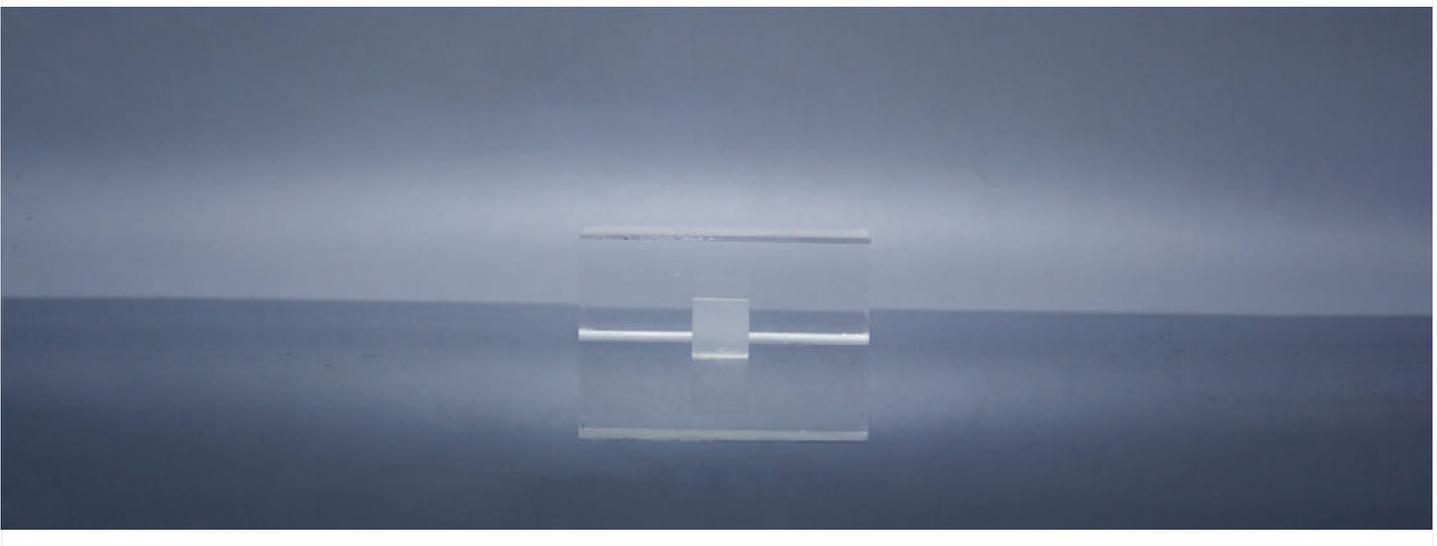


LaCl₃



DESCRIPTION

LaCl₃ crystal has UCl₃ type structure, space group P6₃/m, and it has attracted much attention for its high light output as well as good energy resolution. These unique properties made LaCl₃ crystal a promising material as scintillator in the field of high-energy physics experiments and medical imaging, as well.

LaCl₃ crystal belongs to hexagonal system, density is 3.8g/cm³. Its energy resolution is 3.1%, decay time With 26 ns and a time resolution of 224 ps, there is almost no damage after exposure to gamma rays up to 3 kGy. Such excellent scintillation performance is very rare in inorganic compounds. The energy is 60 keV to 1275 keV. Under the excitation of γ -ray source, the nonlinear response coefficient of light output is 7%, which is far superior to LSO:Ce crystal (35%), NaI: Tl crystal (15%) and CsI: Tl (20%). Compared with the commercially available scintillation crystal, it not only has high light output, fast decay time, good energy resolution and time resolution, but also has very low nonlinear energy response, so it is expected to be applied to Nuclear Medicine Imaging for Low Dose Radiation Detection-SPECT, safety inspection, geological exploration, environmental testing, nuclear diffusion inspection, etc.

FEATURES

- High light output
- Fast response
- Excellent energy resolution
- Good time resolution
- High chemical resistance

APPLICATIONS

- SPECT
- Safety inspection
- geological exploration
- Environmental testing

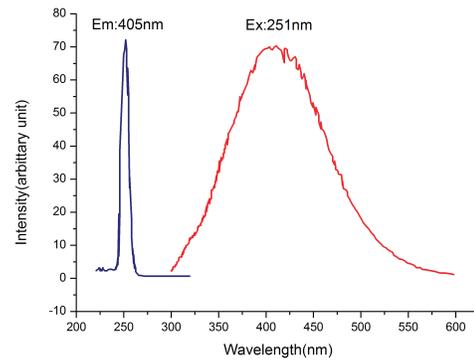


LaCl₃

PARAMETERS

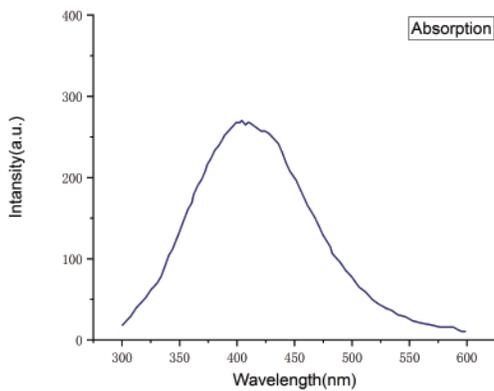
MATERIAL AND SCINTILLATOR PROPERTIES

Property	Value
Materials	LaCl ₃
Density (g/cm ³)	3.8
Melting point (°C)	860
Decay time (ns)	28
Emission peak (nm)	350, 430
Light yield (photons/keV)	49
Photon yield (10 ³ ph/MeV)	34 ± 1
Energy resolution R (%)	4.7 ± 0.2
Light output (photons/MeV)	50,500
Absorbed γ-ray energy (keV)	662, 60
Photoelectron yield [% of NaI(Tl)](for γ-rays)	35
Energy resolution (%)	10.5 ± 0.9

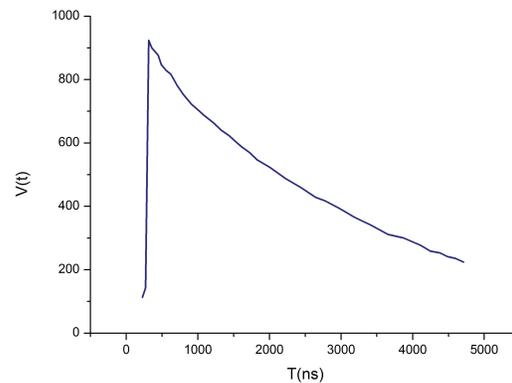


Emission and excitation spectra as a function of wavelength for LaCl₃ crystal

SPECTRA



X-ray stimulated luminescence spectrum as a function of wavelength for LaCl₃ crystal



Fluorescence decay curve of undoped LaCl₃ crystal under pulsed X-ray excitation

