

Lutetium-gadolinium orthosilicate $\text{Lu}_{2x}\text{Gd}_{2-2x}\text{SiO}_5:\text{Ce}$ (LGSO:Ce)

Ce-doped rare-earth orthosilicates are known scintillators used in medical equipment, high-energy physics, well logging, x-ray radiography. Afterglow level in LGSO:Ce is by 2 orders of magnitude lower in comparison with lutetium orthosilicate (LSO:Ce) together with good energy resolution and high light yield. Mechanical hardness of LGSO is improved in comparison with gadolinium orthosilicates (GSO)

Crystal size – up to 60 mm dia. and 120 mm length

Light yield – 20000-22000 phot/MeV;

Energy resolution (662KeV) – 6.9 – 7.3 %;

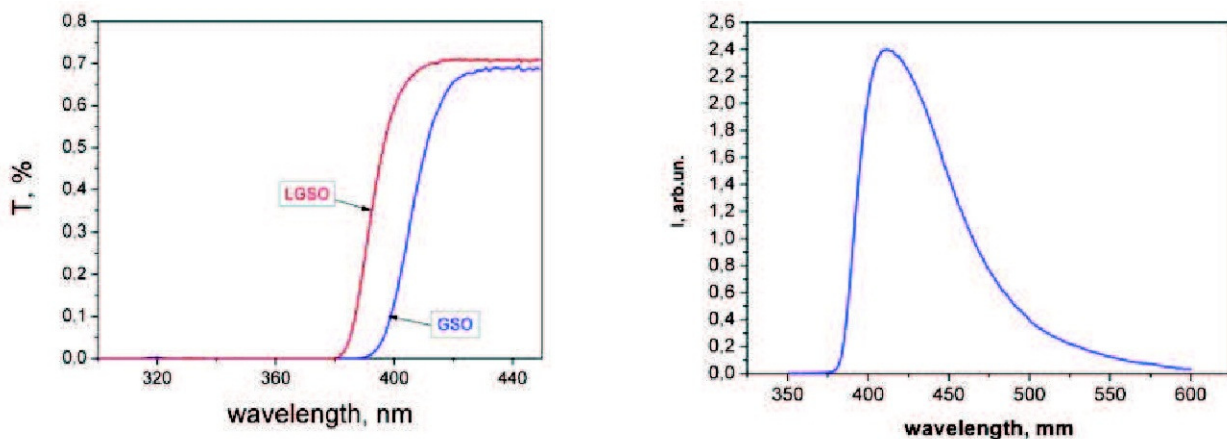
Afterglow level – 0.01 – 0.02 % (after 20 ms)

Density ~ 7 g/cm³

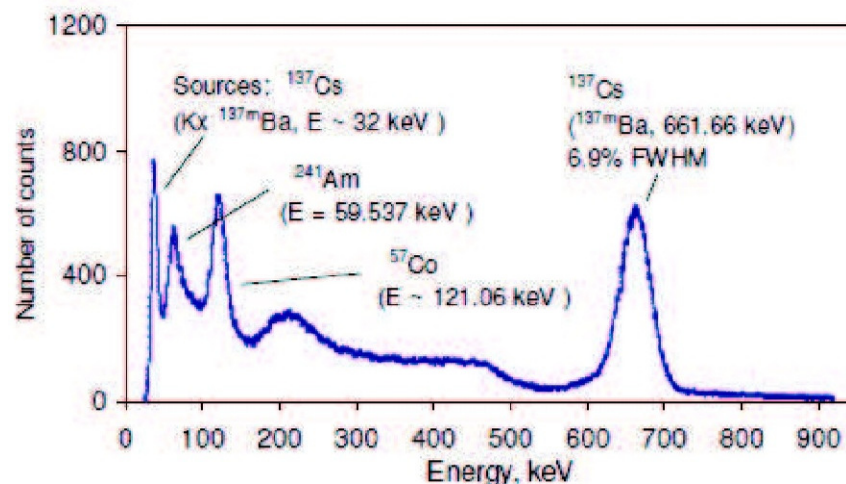
Refraction index ~ 1.8

Decay time at γ -excitation – 30-35 ns, slow component (~100 ns) contribution – not more than 5 %.

Hygroscopicity - no



Transmission and X-ray luminescence spectra of LGSO:Ce (2 mm thick)



Energy spectrum of $\text{Lu}_{0.8}\text{Gd}_{1.2}\text{SiO}_5:\text{Ce}$ scintillator with the dimensions 10x10x10 mm