

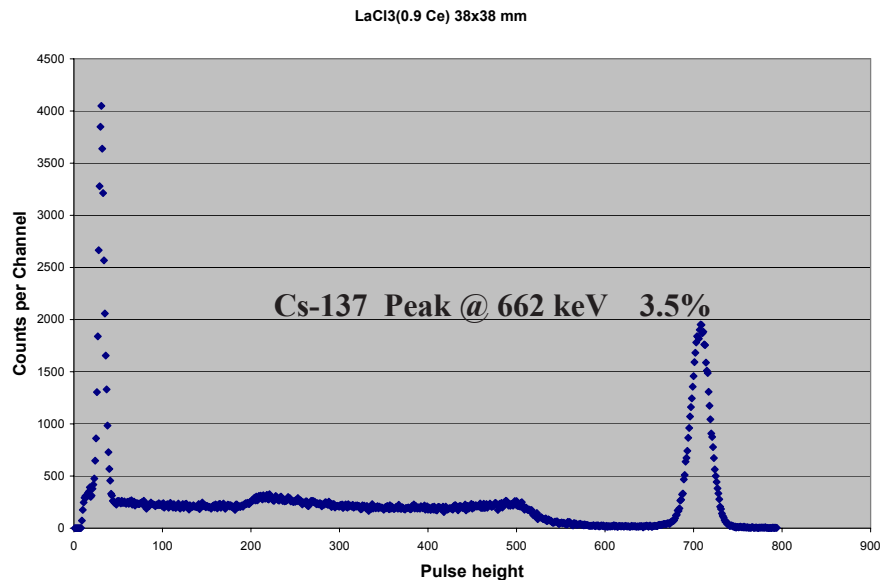


Data Sheet

LaCl₃:Ce Scintillation Crystals (0.9 % Ce)

LaCl₃:Ce scintillation crystals offer an alternative to NaI(Tl) for gamma spectrometric applications. Above a gamma energy of about 200 keV, the energy resolution of LaCl₃:Ce is superior to NaI(Tl) due to the presence of natural Lanthanum. LaCl₃:Ce has a natural beta background between 240 and 1560 keV. In addition to that, lines at 34 keV and 1435 keV can be observed (see data below). For quality assurance reasons LaCl₃:Ce crystals are only supplied in combination with photomultiplier tubes in integral assemblies.

Energy [keV]	Typical Energy Resolution [%]	
	NaI(Tl)	LaCl ₃
30	18	25
60	12	16
81	11	13
122	9	11
356	8	6
511	7	5
662	6.5	4
1332	5	3
2600	4	2.5



Radiological Background LaCl₃:Ce

Background numbers apply to relative small (maximum 38 x 38 mm) crystals

Total	1.16 c/s/cc
34 keV	0.78 c/s/cc
Beta	0.34 cps/cc (240 keV - 1560 keV)

Dedicated Scintillation Detectors



Scionix Manufactures Detectors from these Materials

Material	Density (g/cm ³)	Emission Maximum (nm)	Decay Constant (1)	Refractive Index (2)	Conversion Efficiency (3)	Hygroscopic
NaI(Tl)	3.67	415	0.23 μ s	1.85	100	yes
CsI(Tl)	4.51	550	0.6/3.4 μ s	1.79	45	no
CsI(Na)	4.51	420	0.63 μ s	1.84	85	slightly
CsI(undoped)	4.51	315	16 ns	1.95	4 - 6	no
CaF₂(Eu)	3.18	435	0.84 μ s	1.47	50	no
LaCl₃:Ce(0.9)	3.79	350	70 ns	1.90	95 - 100	yes
⁶Li - glass	2.6	390/430	60 ns	1.56	4 - 6	no
⁶LiI(Eu)	4.08	470	1.4 μ s	1.96	35	yes
BaF₂	4.88	315 220	0.63 μ s / 0.8 ns	1.50 1.54	16 5	no
YAP(Ce)	5.55	3.5	27 ns	1.94	35 - 40	no
GSO(Ce)	6.71	440	30 - 60 ns	1.85	20 - 25	no
BGO	7.13	480	0.3 μ s	2.15	15 - 20	no
CdWO₄	7.90	470/540	20/5 μ s	2.3	25 - 30	no
PbWO₄	8.28	420	7 ns	2.16	0.20	no
Plastics	1.03	375/600	1 ns	1.58	25 - 30	no

(1) Effective average decay time for γ -rays

(2) At the wavelength of the emission maximum.

(3) Relative scintillation signal at room temperature for γ -rays when coupled to a Photomultiplier Tube with a Be-Alkali Photocathode

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