SCIONIX

Application Note

Physical properties of the most common inorganic scintillation materials

Material	Density (g/cm^3)	Emission Maximum (nm)	Decay Constant (1)	Refractive Index (2)	Photo-electron yield (3)	Hygroscopic
NaI(Tl)	3.67	415	0.23 µs	1.85	100	yes
CsI(Tl)	4.51	550	0.6/3.4 µs	1.79	45	slightly
CsI(Na)	4.51	420	0.63 µs	1.84	85	yes
CsI(Undoped)	4.51	315	16 ns	1.95	4-6	no
$Cs_2LiYCl_6(Ce)$ (CLYC)	3.31	370	1/50/1000 ns	1.81	30-40	yes
$CaF_2(Eu)$	3.18	435	0.84 µs	1.47	50	no
$Cs_2LiLaBr_{4.8}Cl_{1.2}(Ce)$ (CLLBC)	4.08	420	120 ns 500 ns	1.90	70	yes
$SrI_2(Eu)$	4.60	450	1-5 µs	1.85	120-140	yes
$LaBr_{2.85}Cl_{0.15}(Ce)$ (LBC)	4.95	380	22 ns	1.90	140	yes
$LaBr_3(Ce)$	5.07	370	16-20 ns	2.09	150	yes
^{6}Li-glass	2.6	390	60 ns	1.56	4-6	no
BaF_2	4.88	315 220	0.63 µs/ 0.8 ns	150 1.54	16 5	no
$CeBr_3$	5.18	370	18-25 ns	2.09	130	yes
YAP(Ce)	5.55	350	27 ns	1.94	35-40	no
$Gd_3Al_2Ga_2O_{12}(Ce)$ (GAGG)	6.60	520	100 ns (average)	1.85	35-40	no
LYSO(Ce)	7.20	420	50 ns	1.82	70-80	no
BGO	7.13	480	0.3 µs	2.15	15-20	no
$CdWO_4$	7.90	540	20/5 µs	2.3	25-30	no
$PbWO_4$	8.28	420	7 ns	2.16	0.20	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 bi-alkali photocathode.
(*) approximate data

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Scionix Holland B.V.
Regulierenring 5
3981 LA Bunnik
The Netherlands
Tel: + 31 30 657 03 12
Web: www.scionix.nl
E-mail: sales@scionix.nl