

Table 1
Lifetimes of several powdered scintillators.

Powder	Fast component decay time (ns)	Slow component decay time (ns)
BGO*	30.4 (1.1)†	295.9 (1.8) (300‡)
BGO	29.3 (0.8)†	295.3 (1.3)
BaF ₂	1.90 (0.05)	621.9 (3.6)
CeF ₃	4.3 (0.1)	31.3 (0.7)
CsI	2.50 (0.04)	17.3 (0.2)

* This sample is a single crystal. † Intensity of fast component less than 6%. ‡ Anderson (1989).

Table 2
Relative intensity observed from different GSO powders and the intensity normalized to that of BGO.

Sample	Handling process	Relative intensity I	Relative intensity I_0
BGO	Pure powder	1000	1000
GSO	Deposition	38	69
GSO(1A)	0.5% Ce solution	72	131
GSO(2A)	Drying 1% Ce	94	171
GSO(1B)	1% Ce solution	271	494
GSO(2B)	Drying 1.27% Ce	453	825

3. Results

More than ten powdered samples were observed in the course of these experiments. As an example, the decay spectrum of BaF₂ is shown in Fig. 2 and is quite typical. It can be seen that both a fast and a slow component exist in the same spectrum with characteristic decay times of 1.9 and 621.9 ns, respectively, which are quite close to those estimated by other methods (Anderson, 1989). The data recorded here were fitted by using a function $F(t)$, with the aid of a physics analysis workstation (PAW), whereby the function $F(t)$ is given by:

$$F(t) = \sum_{j=1}^N I \exp(-t/T_j),$$

where $N = 2$. The measured lifetimes of the powders are listed in Table 1.

Our method is sensitive to the scintillation intensity emitted by the powder. The intensity of gadolinium silicate (GSO) from different sources has also been measured. The light yield of GSO was normalized to that of bismuth germanate (BGO). Table 2 shows the results, where the intensity I is the observed fluorescence yield and I_0 is the fluorescence produced at the surface of the powder.

4. Conclusions

The results can be summarized as follows:

(1) The measured fluorescence decay times for the powdered samples BGO, BaF₂, CeF₃ and CsI by this method are in reasonable agreement with previous results (Herve *et al.*, 1992; Anderson, 1989).

(2) By comparing the decay times of a single crystal of BGO and powdered BGO, we suggest that there is no difference between the two types of samples, within error.

(3) It is easy to see from Table 2 that the method described here is sensitive to the sample preparation method and gives a high light yield from the excited powder.

We have demonstrated that the time resolution of the system is better than 1 ns. The very fast component can therefore be measured to this level. Basic research to find novel materials will be continued in the future using this method.

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References

- Anderson, D. F. (1989). *IEEE Trans. Nucl. Sci.* **36**, 137–140.
 Derenzo, S. E., Moses, W. W., Cahoon, J. L., Perera, R. C. C. & Litton, J. E. (1990). *IEEE Trans. Nucl. Sci.* **37**, 203–208.
 Herve, A., Lecoq, P., Le Goff, J. M. *et al.* (1992). Report CERN/DRDC/92-02. CERN, Geneva, Switzerland.
 Lecoq, P. *et al.* (1991). Report CERN-PPE/91-23. CERN, Geneva, Switzerland.

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A source design strategy providing 5 eV–100 keV photons. Erratum

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An error in the paper by Suller [*J. Synchrotron Rad.* (1994). **1**, 5–11] is corrected. The units for the ordinate in the caption for Fig. 7 should be photons s⁻¹ (0.1% bandwidth)⁻¹ mm⁻² mrad⁻² and photons s⁻¹ (0.1% bandwidth)⁻¹, respectively.