



Progress on Scintillating Glass

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Progresses

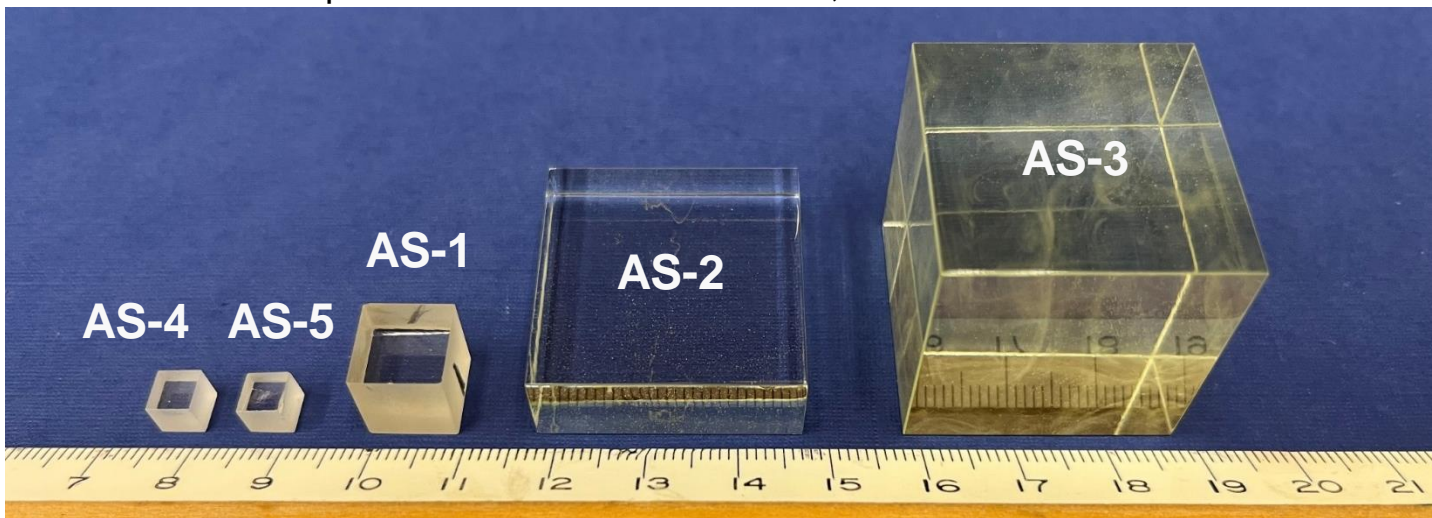
Inorganic scintillator crystals relevant for the CalVision mission characterized at Caltech: BGO, BSO, PbF_2 , PWO and LYSO:Ce.

Three additional aluminoborosilicate glass ($\text{B}_2\text{O}_3\text{-SiO}_2\text{-Al}_2\text{O}_3\text{-Gd}_2\text{O}_3\text{-Ce}_2\text{O}_3$, ABS) samples from IHEP, including one of $25\times 25\times 60\text{ mm}^3$, and one additional barium di-silicate (BaO-2SiO_2 , DSB) glass sample of $20\times 20\times 150\text{ mm}^3$ from Giessen are received. Plan to report results in future CalVision meetings.

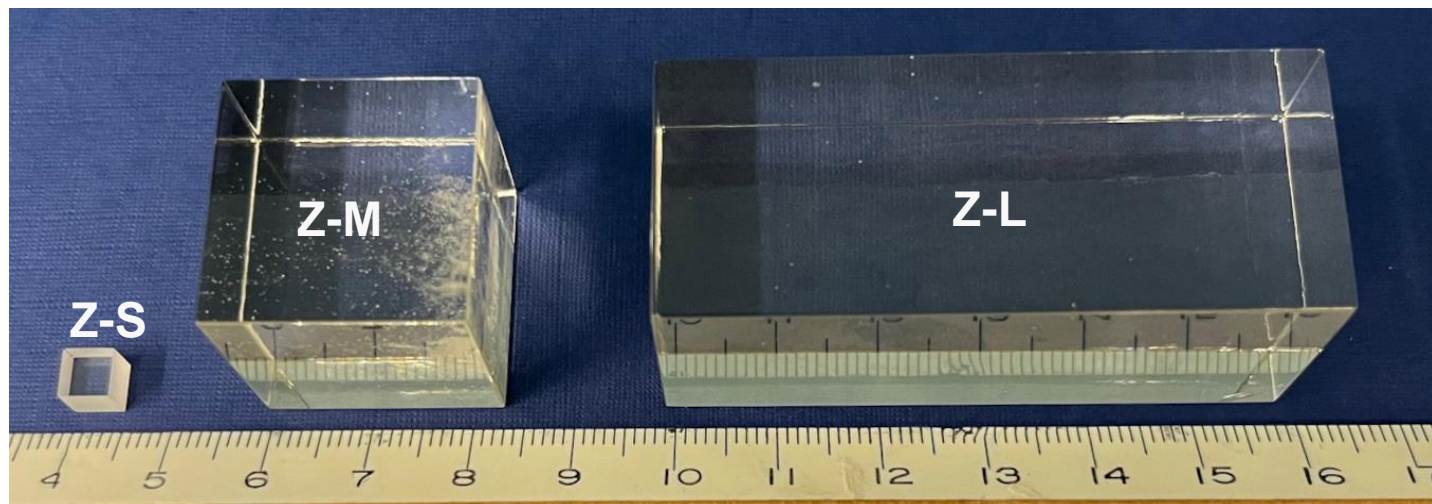
Visited RMD Inc. on Nov 29 and had a detailed discussion on its SBIR projects to develop novel heavy inorganic scintillators for future HEP experiments. Glass samples are expected in 2024.

Aluminoborosilicate Glass Samples

The 1st batch samples were received on June 15, 2023.



The 2nd batch samples were received on Nov.22, 2023.

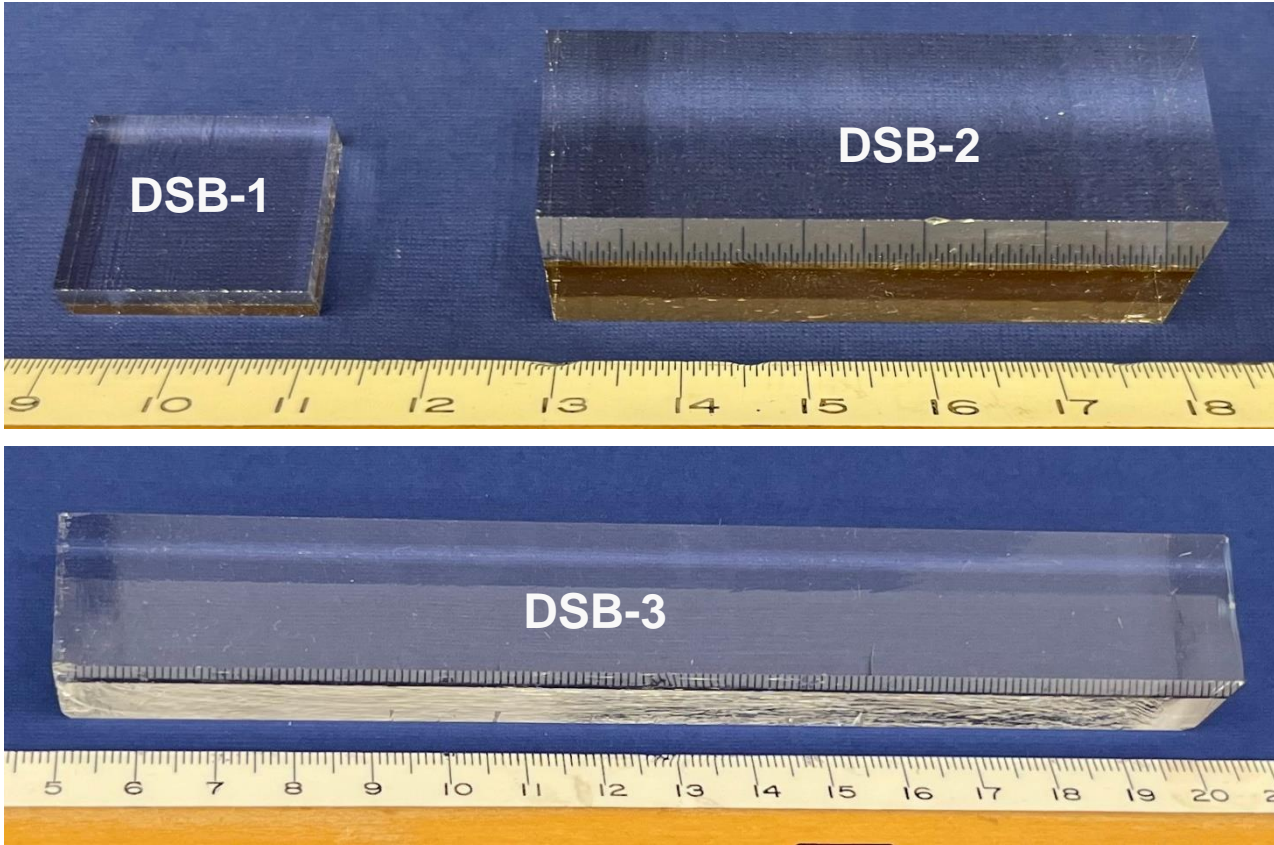


No.	ID	Doping	Dimensions (mm ³)	Lot info.
1	AS-1		10×10×10	NB, low LY
2	AS-2		30×30×10	NB, low LY
3	AS-3		30×30×30	NB, low LY
4	AS-4	1Ce ³⁺	5×5×5	OB, high LO.
5	AS-5	1.5Ce ³⁺	5×5×5	OB, high LO
6	Z-S	Ce ³⁺	5×5×5	Gd-based
7	Z-M	Ce ³⁺	24×24×24	Gd-based
8	Z-L	Ce ³⁺	25×25×60	Gd-based

Measurements at room temperature:

- Transmittance,
- Pulse Height Spectra (PHS),
- Light Output (LO) vs. Gate and Decay Time (τ),
- X-ray excited emission.

DSB:Ce Glass Samples



Measurements at room temperature:

- Transmittance,
- Pulse Height Spectra (PHS),
- Light Output (LO) vs. Gate and Decay Time (τ),
- X-ray excited emission.

No.	ID	Doping	Dimensions (mm ³)	Lot info.	Received date
1	DSB-1	Ce	20x20x5	new batch, low LY	Aug. 2, 2023
2	DSB-2	Ce	20x20x50	new batch, low LY	Aug. 2, 2023
3	DSB-3	Ce	20x20x150	new batch, low LY	Nov. 3, 2023

Glass Sample Density

Glass Sample	Dimension	Measurement (mm)			Volume (cm ³)	Weight (g)	ρ (g/cm ³)
	(mm ³)	L	W	H			
DSB-1	20×20×5	20.015	19.964	5.029	2.010	8.6	4.3
DSB-2	20×20×50	20.015	19.939	50.013	19.959	85.9	4.3
DSB-3	20×20×150	20.142	20.117	150.114	60.826	259.50	4.3
AS-1	10×10×10	9.982	10.084	10.109	1.018	5.1	5.0
AS-2	30×30×10	29.997	29.972	10.008	8.998	48.0	5.3
AS-3	30×30×30	29.997	30.023	28.499	25.666	137.5	5.4
AS-4	5×5×5	4.953	4.953	4.801	0.118	0.705	6.0
AS-5	5×5×5	4.953	4.953	4.648	0.114	0.675	5.9
Z-S	5×5×5	4.953	5.004	5.055	0.125	0.754	6.0
Z-M	24×24×24	23.978	24.003	24.130	13.888	82.8	6.0
Z-L	25×25×60	24.917	24.943	59.944	37.256	222.7	6.0