

## **Lead Acetate Impact on Lead Halide Perovskite (FAPbBr<sub>3</sub>) Polycrystalline Radiation Detector Performance**

*Thursday, 20 July 2023 17:10 (20 minutes)*

In this study, we analyse the performance of polycrystalline pellets of FAPbBr<sub>3</sub> as a semiconductor-based radiation detector, and study the impact of lead acetate (LA) on the FAPbBr<sub>3</sub> X-ray detector performance. Using a hot-pressing method various FAPbBr<sub>3</sub> pellets were fabricated with different concentrations of lead acetate to investigate the improvement in the pellet microstructure and X-ray sensitivity.

The bulk resistivity and of the pellets was studied by I-V measurements, with the addition of LA showing a significant reduction in dark current and increase in resistivity. The X-ray sensitivity measurements of the device were carried out using X-rays from an Amptek Mini X-ray source with an Au anode and an acceleration voltage of 40 kVp. The X-ray sensitivity of the FAPbBr<sub>3</sub> pellet devices with and without LA were studied, and the devices containing LA showed a sensitivity of  $27.5 \pm 0.9 \mu\text{C}/\text{Gy cm}^2$ . We will discuss the role of the LA in improving the density and microstructure of the material, and its effect on charge transport and X-ray sensitivity.

**Primary authors:** SELLIN, Paul; ALGHAMDI, Suad (University of Surrey)

**Co-authors:** Dr WOLFE, Douglas (Applied Research Laboratory, The Pennsylvania State University, University Park, PA, United States); Dr GHOSH, Joydip (University of Surrey); Mr REISS, Justin (Applied Research Laboratory, The Pennsylvania State University, University Park, PA, United States); Mrs ALANAZI, Saeedah (University of Surrey)

**Presenter:** ALGHAMDI, Suad (University of Surrey)

**Session Classification:** Session 4 (Posters)

**Track Classification:** default track