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Single nucleation of Cl-doped $\text{FAPbBr}_{3-x}\text{Cl}_x$ with inhibited ion migration for ambipolar radiation detection

High-quality and dopant-compensated $\text{FAPbBr}_{3-x}\text{Cl}_x$ single crystals are demonstrated. After employing chlorine, the nucleation has been well controlled and large-sized bulk crystal are obtained. Besides, as-grown $\text{FAPbBr}_{2.9}\text{Cl}_{0.1}$ exhibits a high resistivity of $4.13 \times 10^9 \Omega\text{-cm}$, comparable hole and electron mobility-lifetime products of $(1.5\text{-}2.1) \times 10^{-4} \text{ cm}^2\text{V}^{-1}$, and a high activation energy of 0.58 eV, yielding an excellent charge transport and collection. Finally, the well-defined ^{241}Am α -particle spectra are collected with energy resolution of 21.3% for hole and 19.2% for electron.

As featured in:



See Xin Liu, Yadong Xu *et al.*,
J. Mater. Chem. A, 2024, **12**, 3304.