

Electronic Supplementary Information

Band engineering at the interface of all-inorganic CsPbI₂Br solar cells

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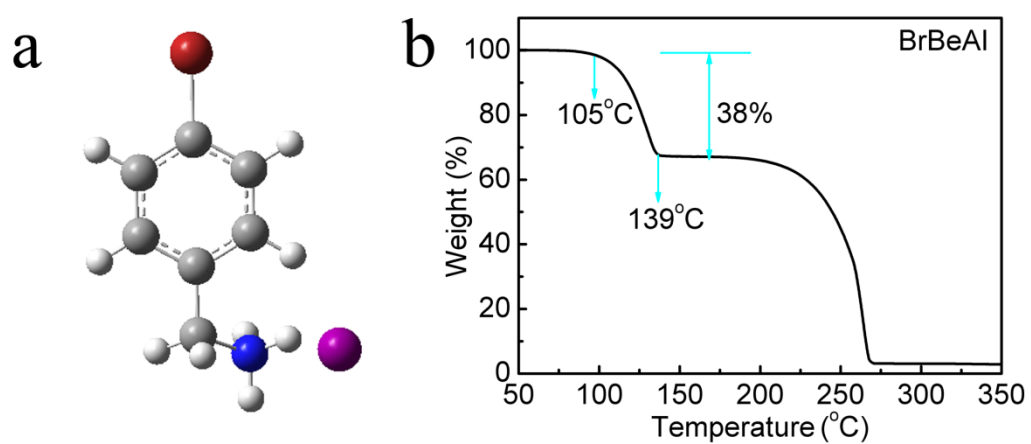


Fig. S1. Fundamental characteristics of BrBeAl: (a) the molecular structure, (b) thermogravimetric Analysis (TGA) pattern.

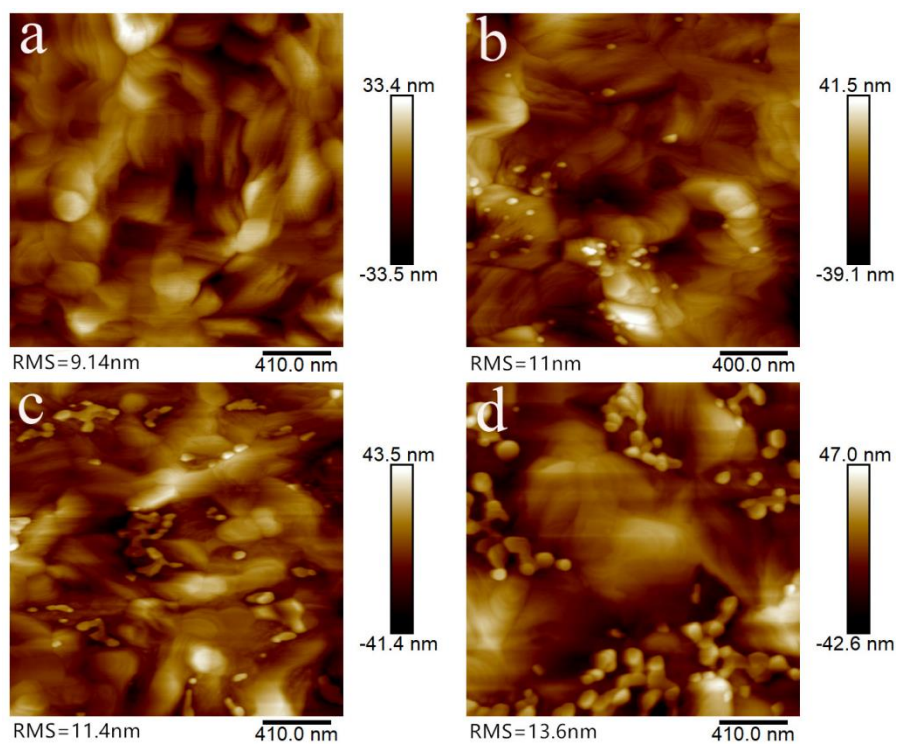


Fig. S2. Atomic force microscopy (AFM) images of the BrBeAl-CsPbI₂Br thin films.

(a) pristine perovskite, (b) BrBeAl-1, (c) BrBeAl-2, (d) BrBeAl-4.

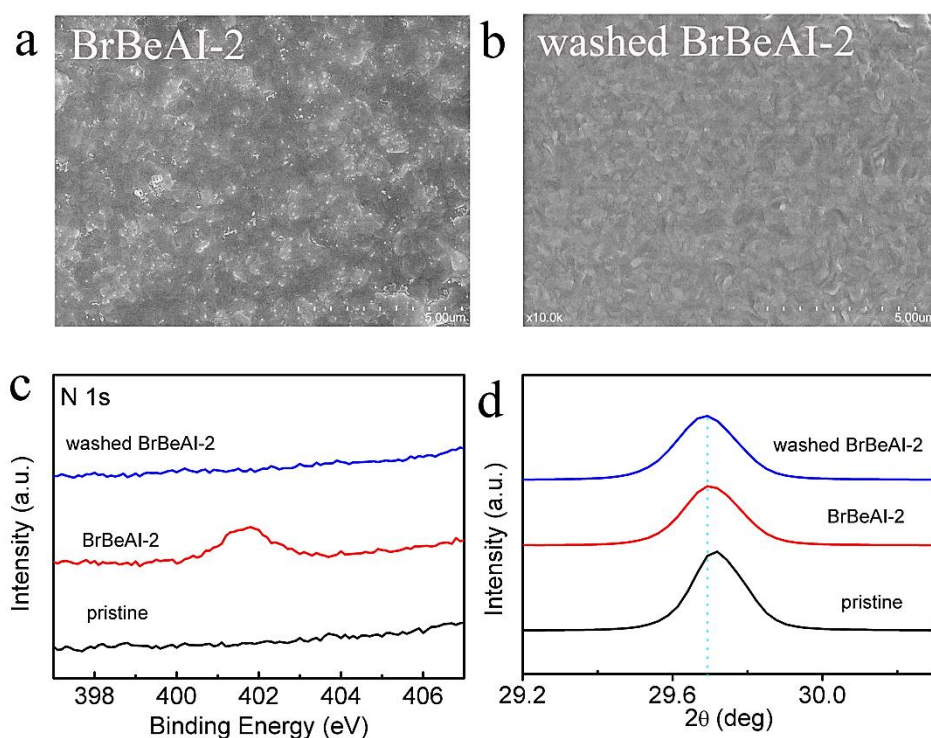


Fig. S3. Morphologies and structure characteristics of CsPbI₂Br thin films treated with different BrBeAl contents: (a) and (b) top-surface SEM images, (c) N 1s core-level spectra and (d) XRD patterns.

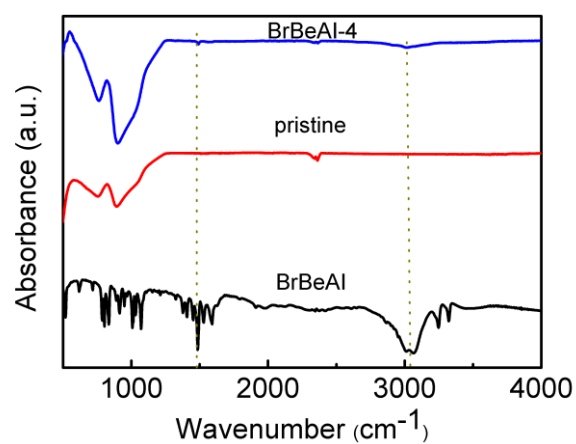


Fig. S4. FTIR patterns of BrBeAl, pristine perovskite, and BrBeAl-4 thin films.

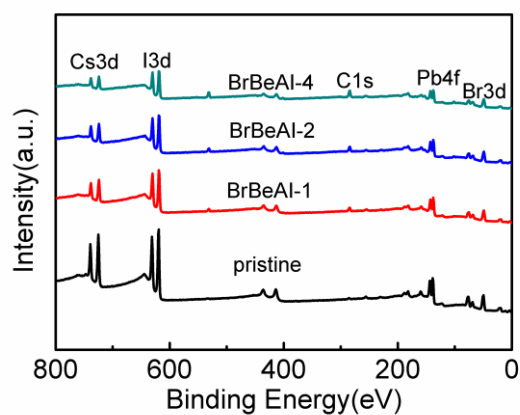


Fig. S5. XPS spectra for the pristine perovskite, BrBeAl-1, BrBeAl-2 and BrBeAl-4 thin films.

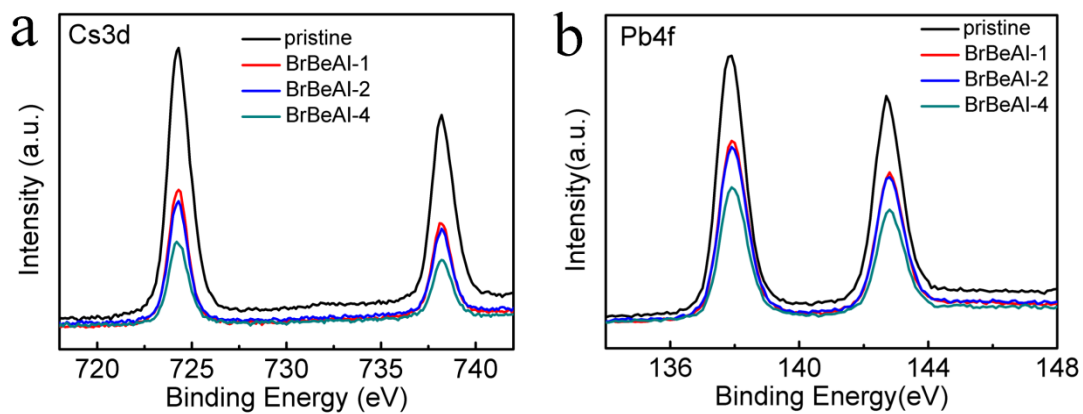


Fig. S6. (a) Cs 3d and (b) Pb 4f core-level spectra for the pristine perovskite, BrBeAl-1, BrBeAl-2 and BrBeAl-4 thin films.

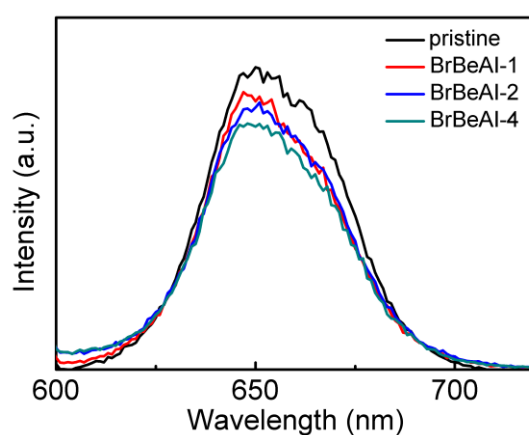


Fig. S7. PL spectra for pristine perovskite, BrBeAl-1, BrBeAl-2 and BrBeAl-4 thin films.

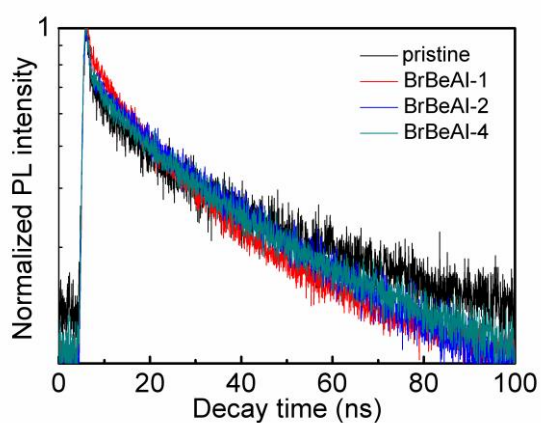


Fig. S8. TRPL of pristine perovskite, BrBeAl-1, BrBeAl-2 and BrBeAl-4 thin films.



Fig. S9. The water contact angle characterization for pristine perovskite and BrBeAl-2 thin films.

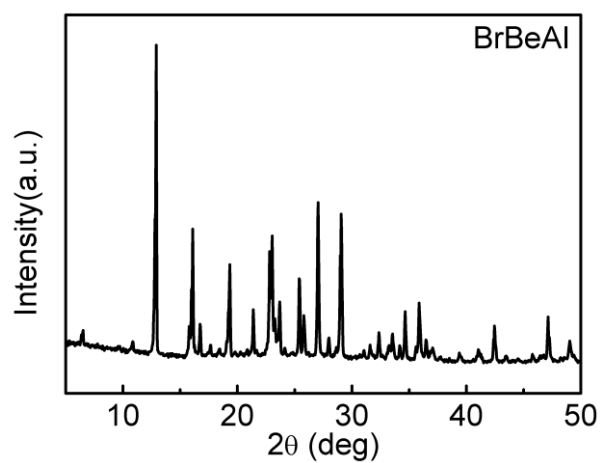


Fig. S10. XRD patterns of BrBeAl.

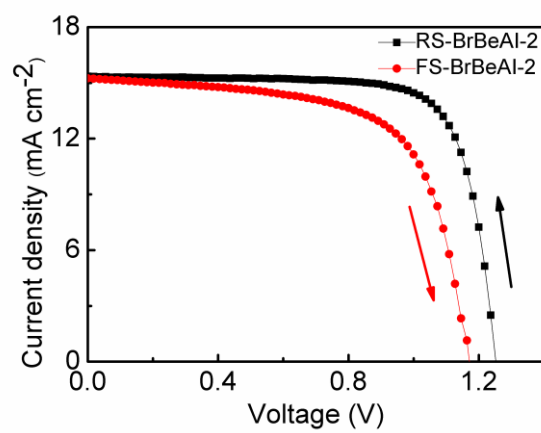


Fig. S11. *J*-*V* characteristics of BrBeAl-2 based PSC under both the reverse and forward scan directions.

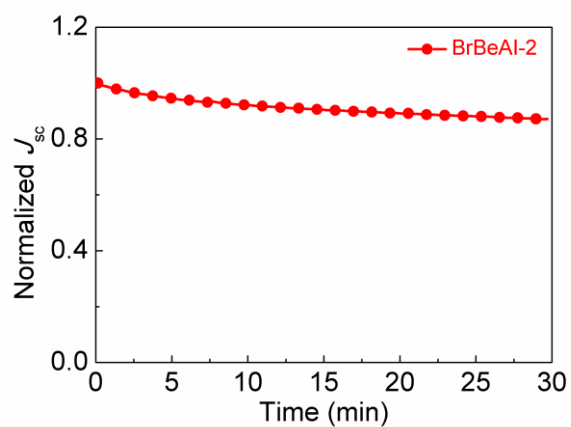


Fig. S12. Electrical stability measured as a function of time for the BrBeAl-2 based PSC at a voltage of 0 V under 1 sun illumination in a N₂ glovebox. After 30 minutes, this device retains 87% of its initial J_{sc} .

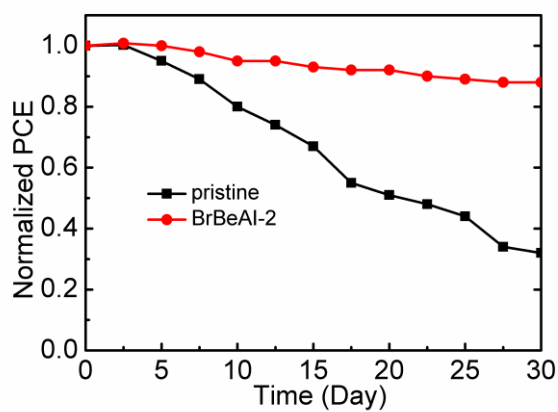


Fig. S13. PCE decay of the pristine and BrBeAl-2 based PSCs as a function of storage time in a dark and dry box with 20% RH at RT.

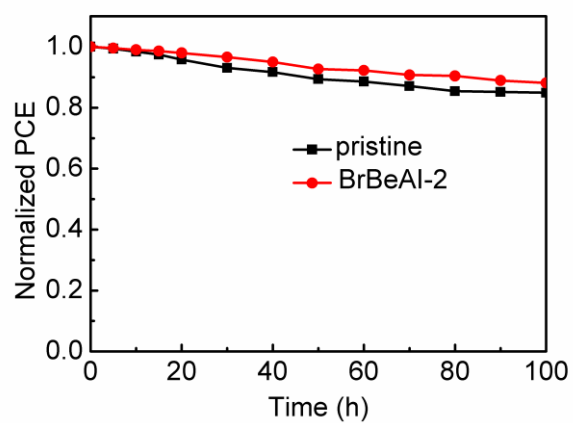


Fig. S14. Thermal stability measured for the pristine and BrBeAl-2 based PSCs at 60 °C in a N₂ glovebox. After 100 h, the BrBeAl-2 based device maintains 88% of its initial PCE. Moreover, the pristine device maintains 85% of its initial PCE.