Cation substitution enables the complete conversion of 1D to 3D perovskite for photovoltaic application

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Supporting Information
Supplementary results:

![Graph showing normalized PL spectra of different perovskite films](image)

**Fig. S1** The normalized PL spectra of the different perovskite films

**Fig. S2** The calibration results from The National Institute of Metrology (NIM)
Fig. S3 The histogram of power conversion efficiencies (PCEs) of the device fabricated from PbI₂/EAI=1/1 precursor.

Fig. S4 J-V curves of the cell recorded in reverse and forward scanning directions.
Fig. S5 XRD patterns of the 1D EAPbI$_3$ films obtained from the EAPbI$_3$ solutions with different PbI$_2$/EAI ratios (the ratio of PbI$_2$/EAI=1/0, 1/0.5, 1/1.5) before and after the MA gas treatment.

Fig. S6 The top-view SEM images of the 1D EAPbI$_3$ films obtained from the PbI$_2$/EAI solutions with different ratios (the ratio of PbI$_2$/EAI=1/0, 1/0.5, 1/1.5) before and after the MA gas treatment.