Supporting Information

Polymer Additive-Promoted Porous $PbBr_2$ Layer for Fabricating High-Performance Carbon-Based $CsPbIBr_2$ Perovskite Solar Cells through a Two-Step Sequential Deposition Process

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Fig. S1 Schematic illustration of the fabrication process of $CsPbIBr_2$ perovskite film through a two-step sequential deposition process.

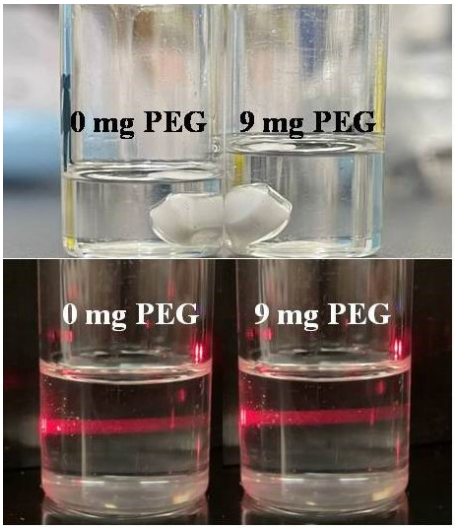

Fig. S2 Photographs of $PbBr_2$ solution without and with 9 mg PEG and their Tyndall effect

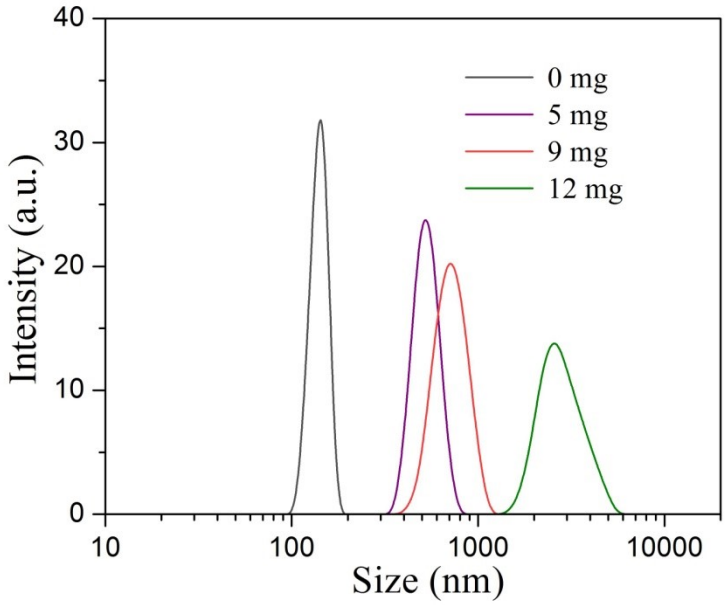

Fig. S3 Size distributions of $PbBr_2$ colloidal particles in the solution with different amounts of PEG detected by dynamic light scattering.

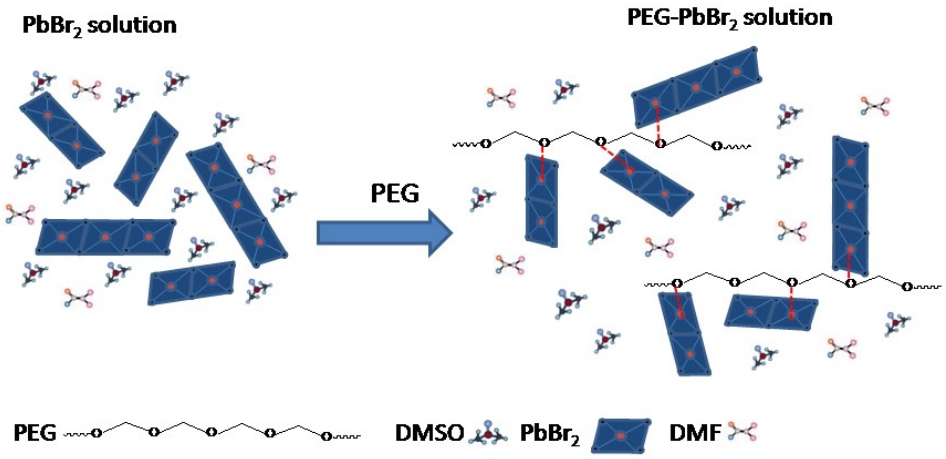

Fig. S4 Schematic process of $PbBr_2$ colloid aggregation induced by PEG additive

Fig. S5 Photographs of $PbBr_2$ film deposited on FTO/TiO_2 substrate without and with 9 mg PEG

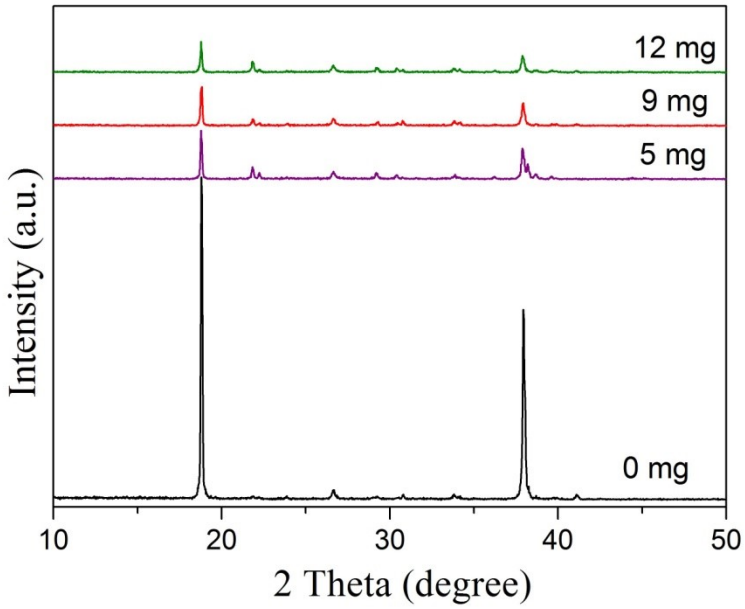

Fig. S6 XRD curves of $PbBr_2$ film with different amounts of PEG

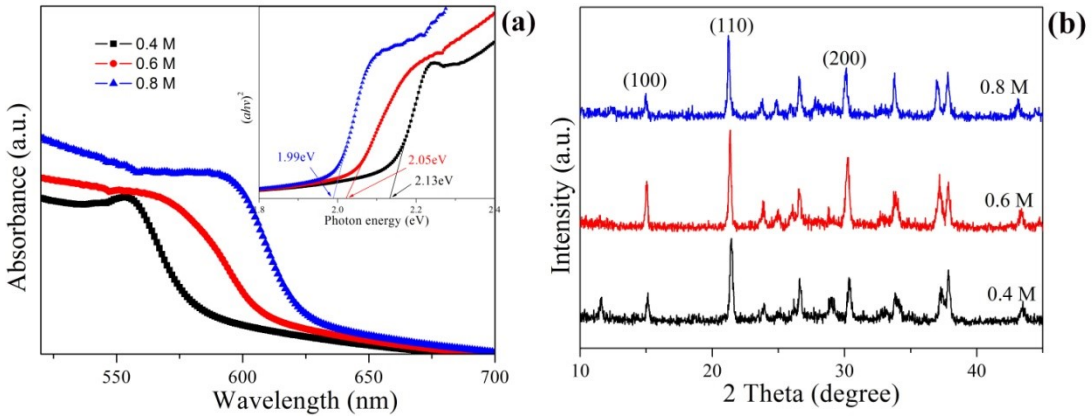

Fig. S7 (a) UV-vis absorption spectra and (b) XRD curves of $CsPbIBr_2$ perovskite obtained from CsI solution with different concentrations.

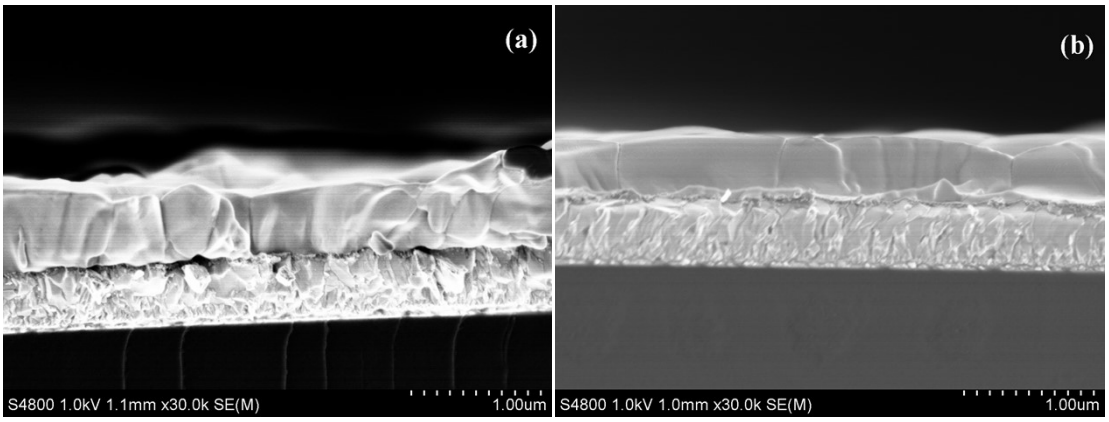

Fig. S8 Cross-sectional SEM images of the control (a) and 9PEG (b) $CsPbIBr_2$ perovskite films

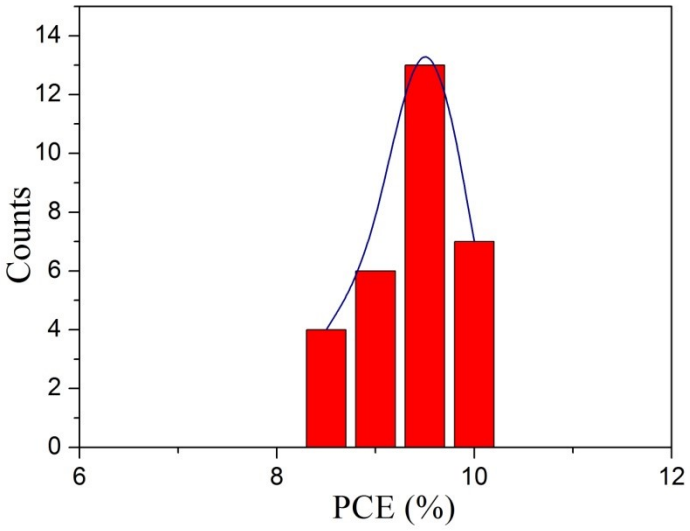

Fig. S9 The statistical PCEs of 30 independent cells based on 9PEG $CsPbIBr_2$ perovskite film.

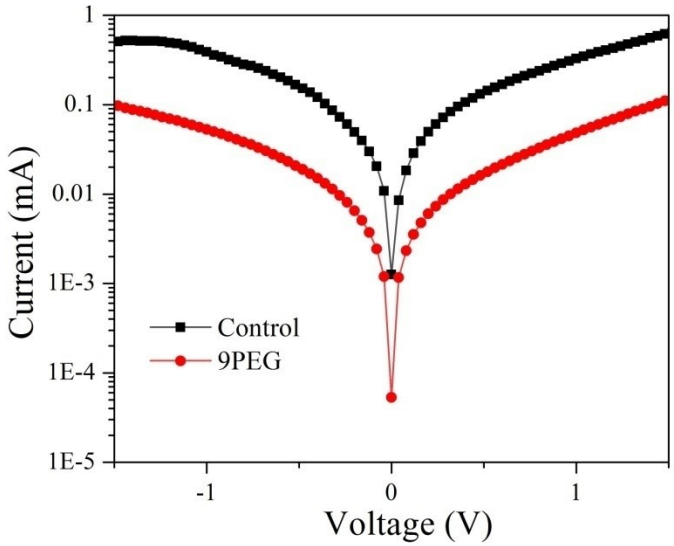

Fig. S10 Dark current density-voltage curves of the devices based on the control and 9PEG $CsPbIBr_2$ perovskite films

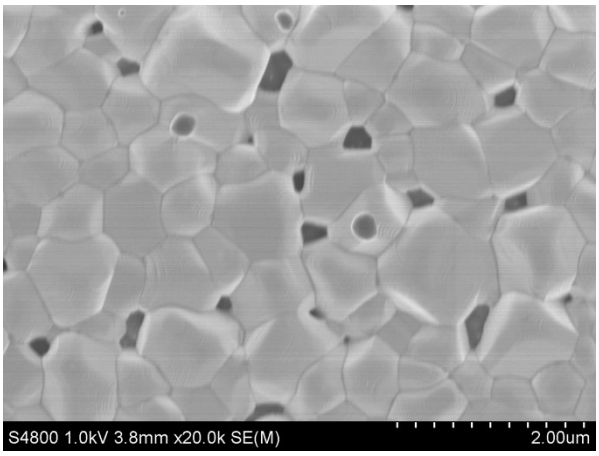

Fig. S11 SEM image of $CsPbIBr_2$ perovskite film obtained by one-step solution process