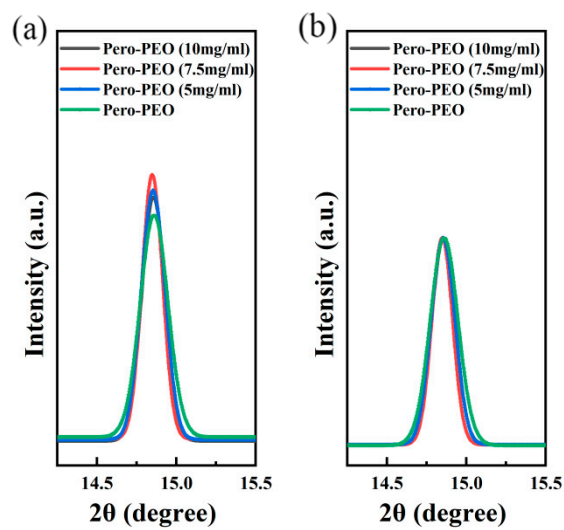
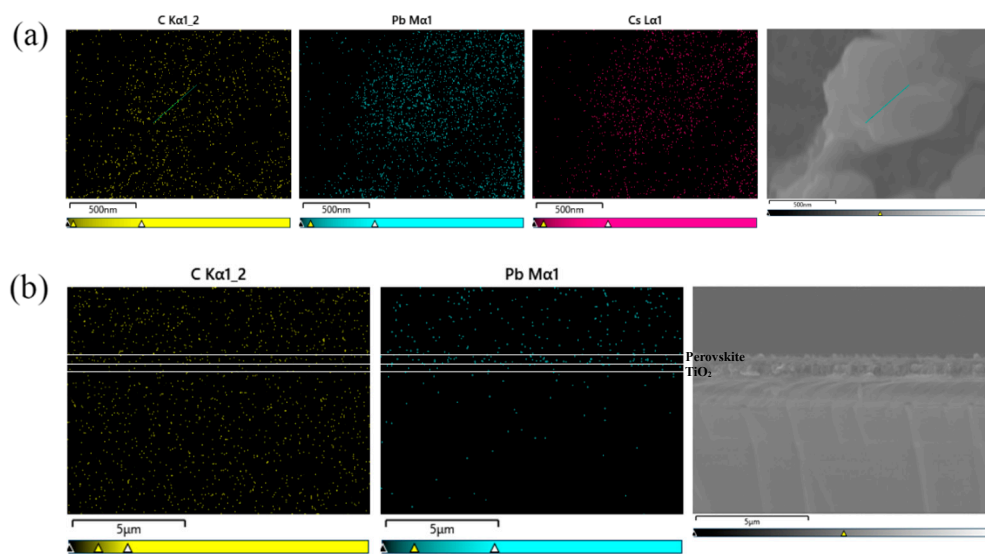


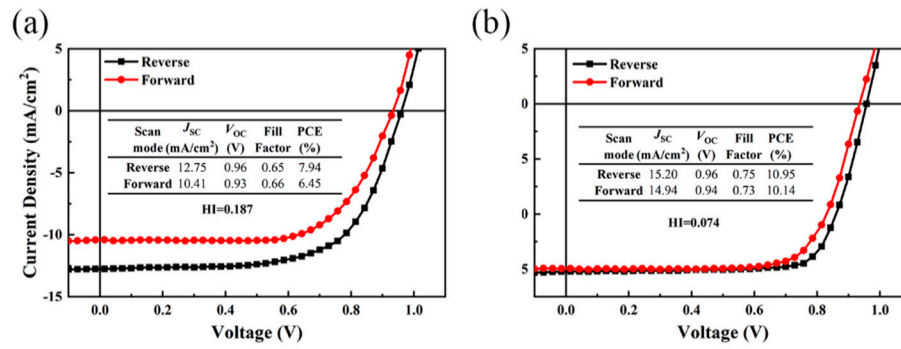
## Supporting materials



**Figure S1.** The (a) fitted and (b) normalized Peaks at 14.8°.



**Figure S2.** EDS images of the CsPbI<sub>3-x</sub>Br<sub>x</sub>-PEO (7.5 mg/mL) films (a) Top-view (b) Cross-sectional.



**Figure S3.** J-V curves scanned from different directions. **(a)** CsPbI<sub>3-x</sub>Br<sub>x</sub> based devices. **(b)** CsPbI<sub>3-x</sub>Br<sub>x</sub>-PEO (7.5 mg/mL)-based devices

The J-V curves test parameters: Area: 0.1 cm<sup>2</sup>; Start Voltage: -0.1 V; Stop Voltage: 1.3 V; Point Num.: 50; Scan Rate: 50 mV s<sup>-1</sup>.