Supporting Information for

Self-Generated Buried Submicrocavities for High Performance Near-Infrared Perovskite Light-Emitting Diode

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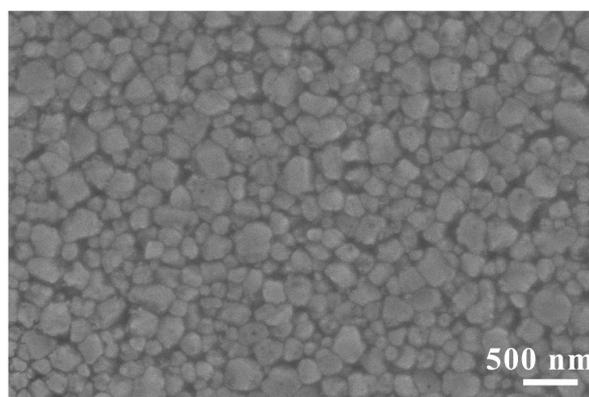
Supplementary Figures

Fig. S1 SEM image of perovskite film (FAI: PbI$_2$ = 1.8:1)
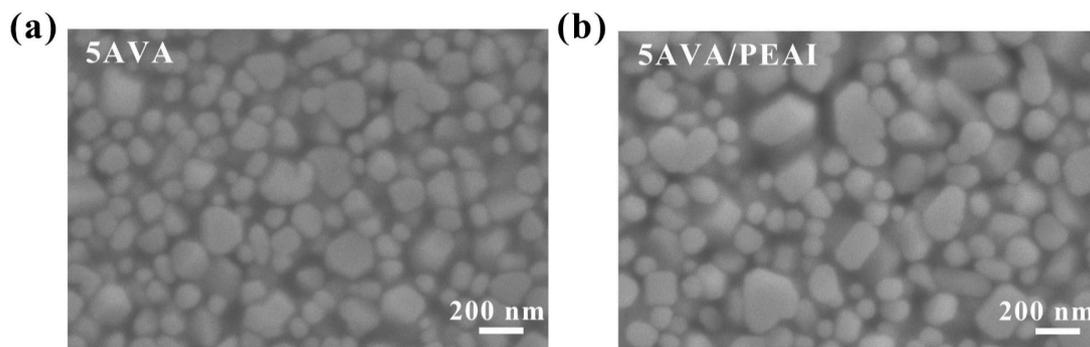
Fig. S2 SEM images of perovskite films. **a** 5AVA. **b** 5AVA/PEAI
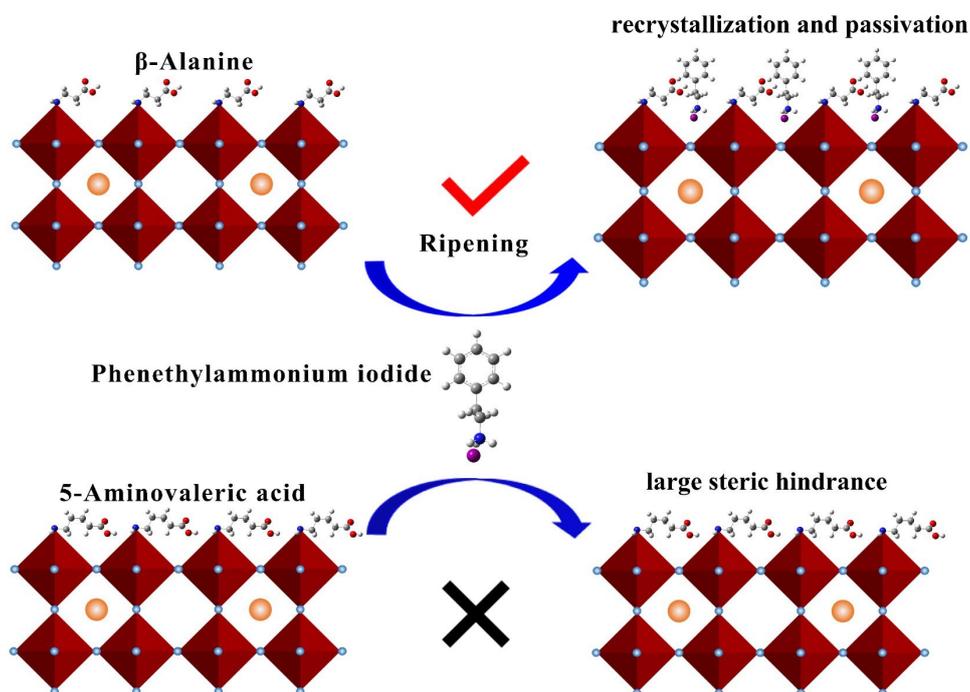

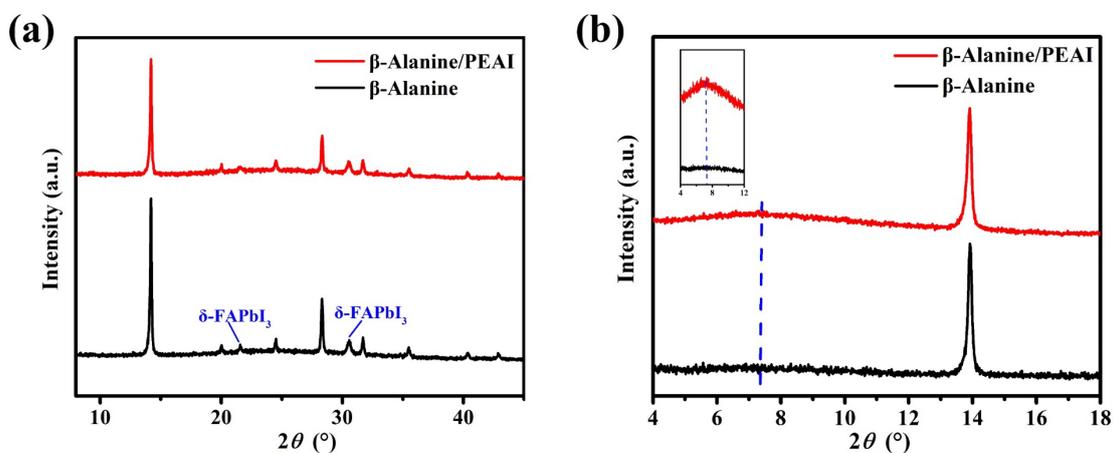**Fig. S3** Schematic diagram of PEAI post-processing

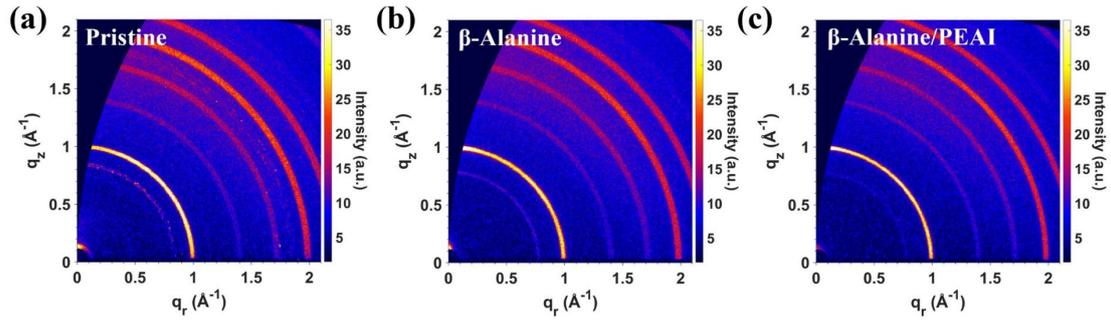**Fig. S4** XRD patterns of the perovskite films

Fig. S5 2D GIWAXS patterns of perovskite films. **a** Pristine. **b** β-Alanine. **c** β-Alanine/PEAI
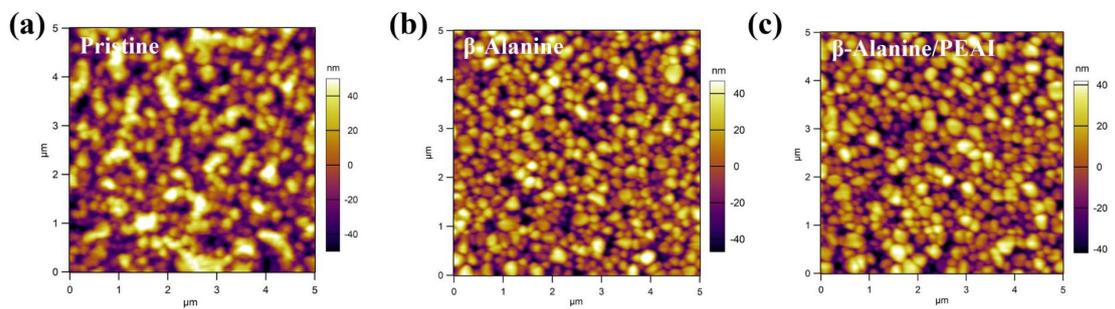

Fig. S6 AFM measurements of perovskite films. **a** Pristine. **b** β-Alanine. **c** β-Alanine/PEAI
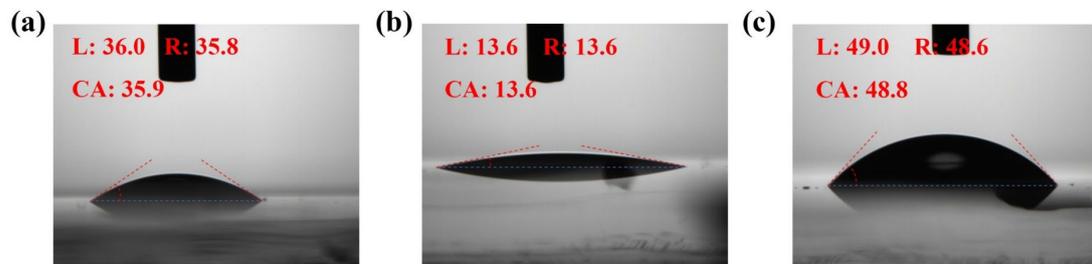

Fig. S7 The water contacts angle measurements of perovskite films. **a** Pristine. **b** β-Alanine. **c** β-Alanine/PEAI
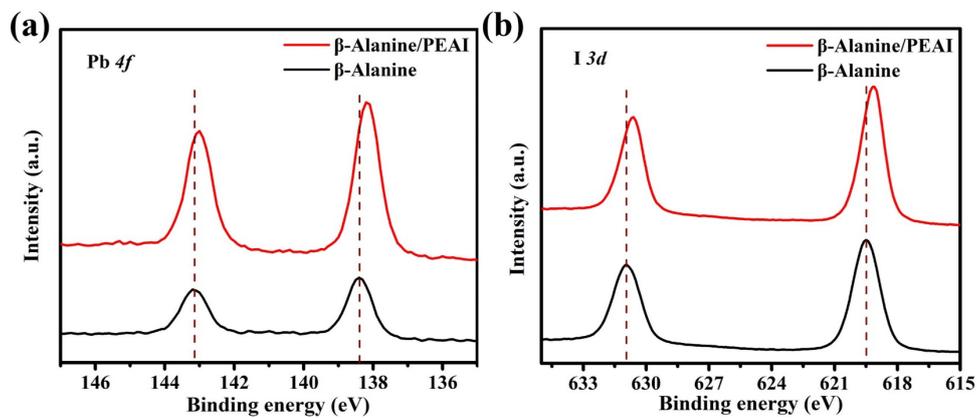

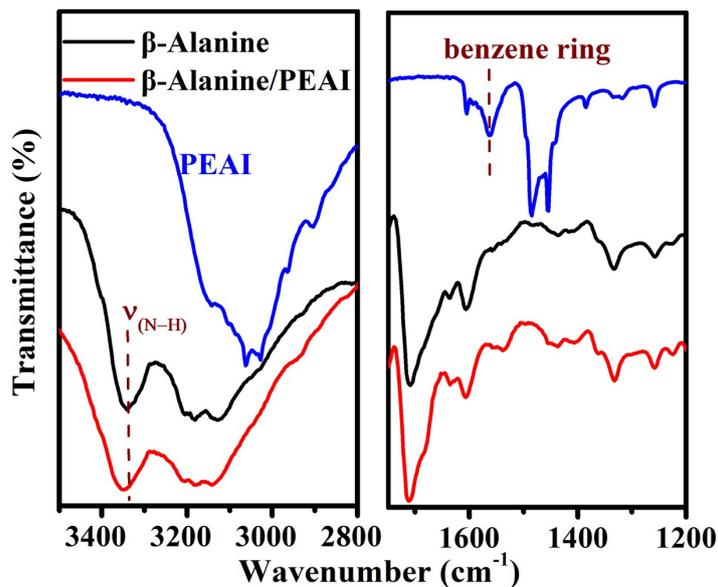**Fig. S8** XPS spectra of perovskite films. **a** Pb *4f* peak. **b** I *3d* peak

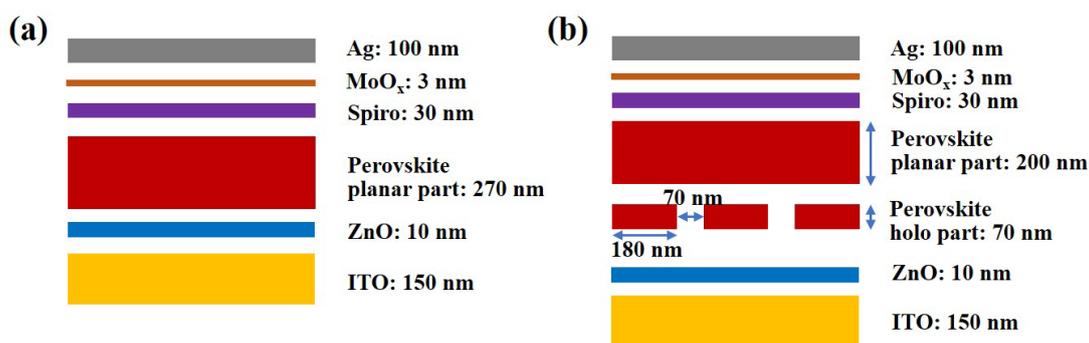**Fig. S9** FTIR spectra of perovskite films

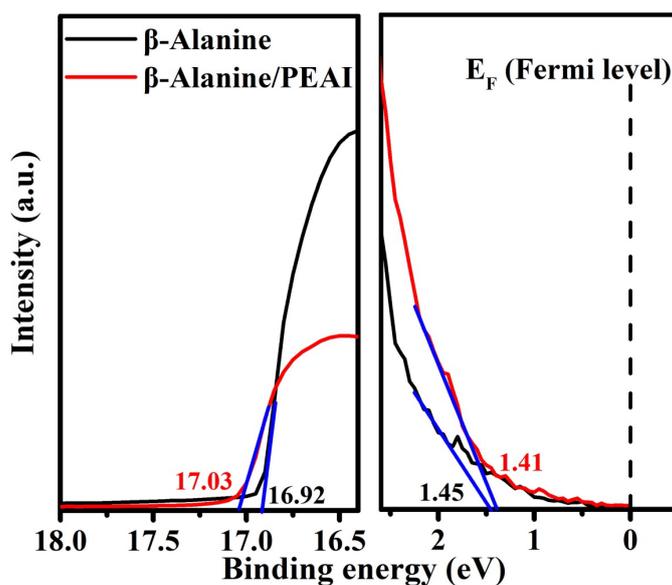**Fig. S10** Simulation models. **a** Planar-structure. **b** Holo-structure

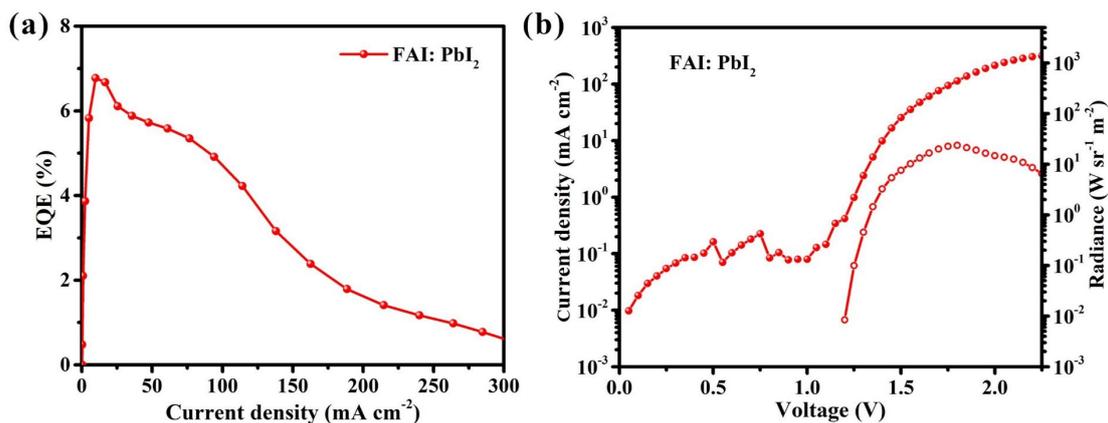**Fig. S11** UPS spectra of perovskite films

Fig. S12 a EQE diagram of pristine PeLED. **b** The Current density-voltage-radiance curves of pristine PeLED
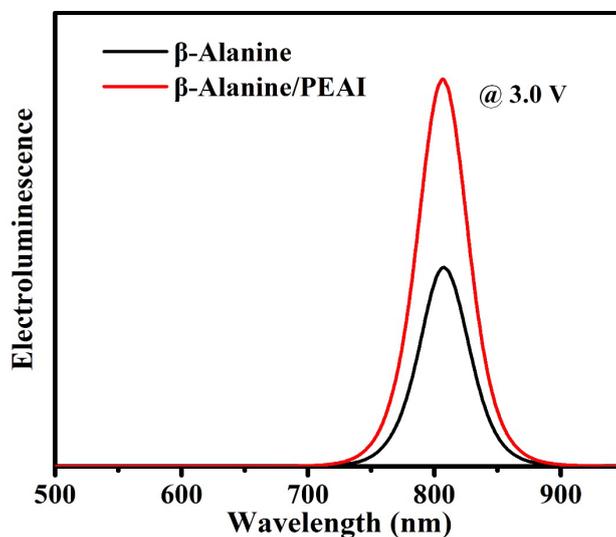

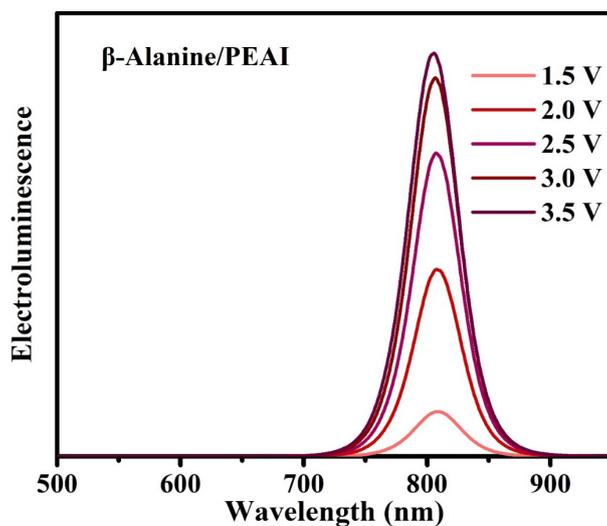**Fig. S13** EL spectra of the PeLEDs without and with PEAI post-treatment

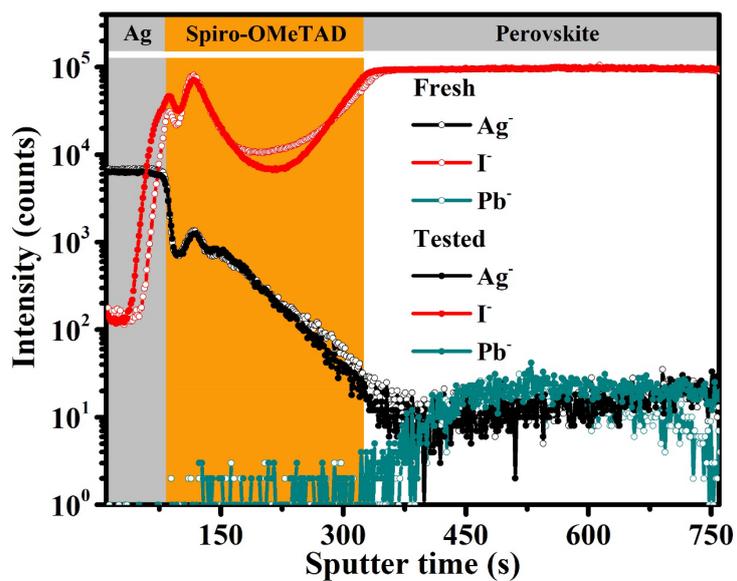**Fig. S14** EL spectra of the PeLED with PEAI post-treatment under different bias voltages

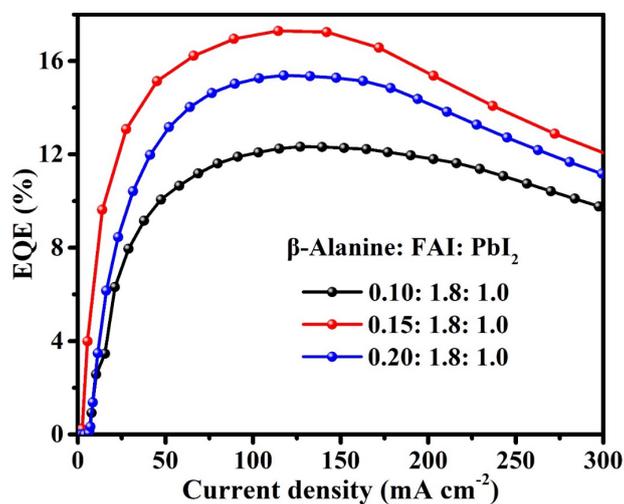**Fig. S15** ToF-SIMS of depth profiles of anion distribution within full PeLED

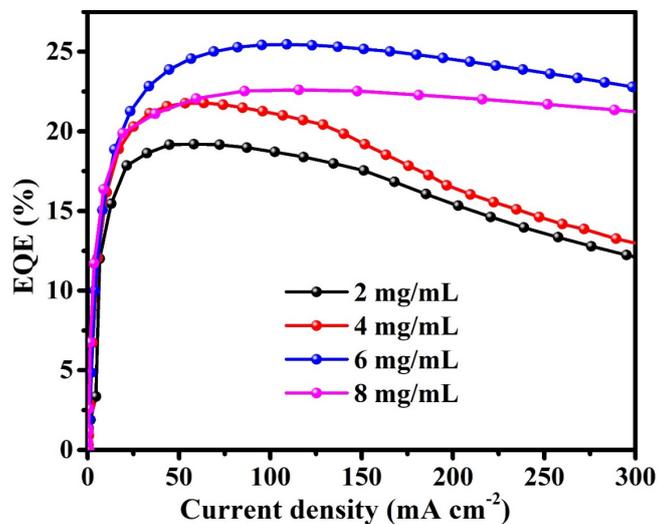**Fig. S16** The effect of β-Alanine concentration on EQE of PeLEDs

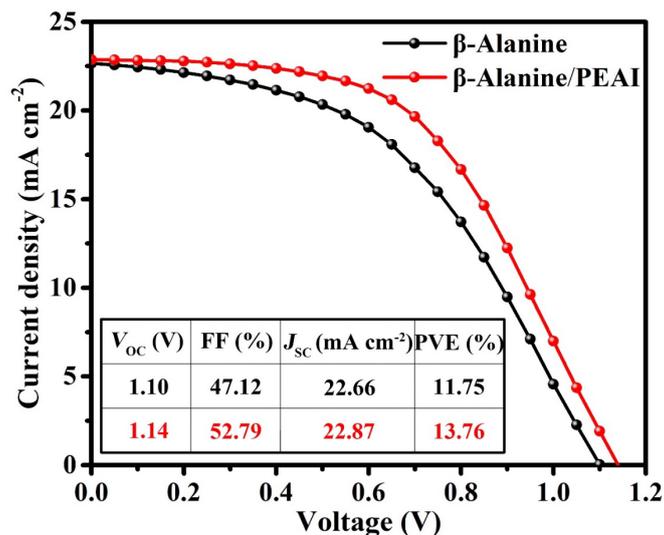**Fig. S17** The effect of PEAI concentration on EQE of PeLEDs

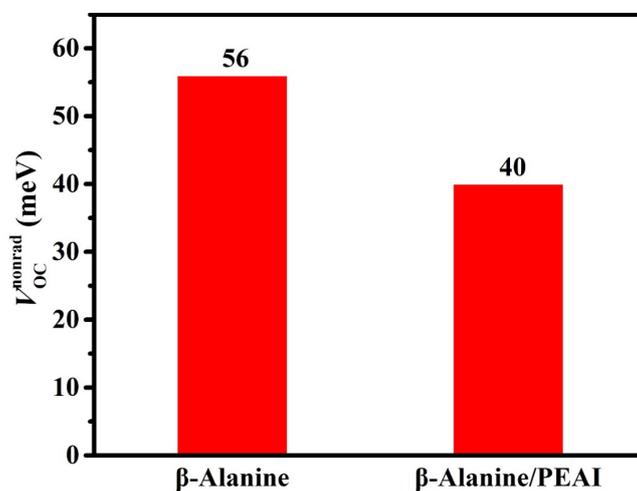**Fig. S18** *J-V* characteristic curves of the PeLEDs

Fig. S19 *V*$_{OC}$ losses caused by nonradiative recombination of devices without and with PEAI post-treatment
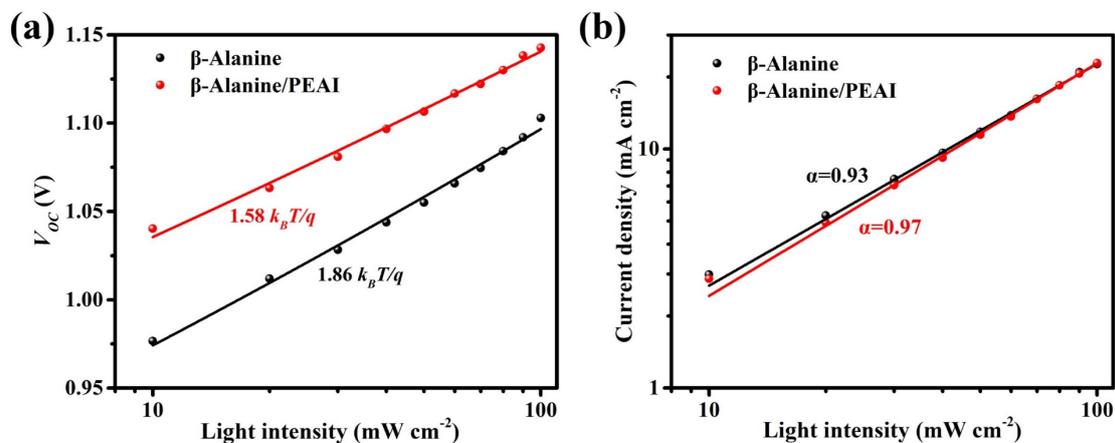

Fig. S20 a The changes of *V*$_{OC}$ against light intensity of the devices. **b** The changes of current density against light intensity of the devices