Supporting Information

Low-temperature Processed Inorganic Perovskites for Flexible Detectors with Broadband Photoresponse

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Figure S1 CsPbBr$_3$ perovskite films obtained with various duration for the first step annealing (a, 5 min; b, 8 min; c, 12 min) and immersion in IPA (d, 2 min; e, 4 min; f, 6 min).

Figure S2 AFM maps of as-prepared CsPbBr$_3$ films with (a) or without (b) SE treatment.
**Figure S3.** EDS spectra of a SE treated CsPbBr$_3$ film. It suggests that the stoichiometric ratio of inorganic perovskite is ~1:1:3 for Cs:Pb:Br.

**Figure S4.** Tack plot curve of the inorganic perovskite film. The optical bandgap of CsPbBr$_3$ was measured to be ~2.28eV.
Figure S5. (a) I-V (b) and I-t characteristics of the flexible CsPbBr$_3$ photodetector without SE treatment.

Figure S6. A reproducible I-t curve of the device based on treated CsPbBr$_3$ film measured under periodic light on/off.
Figure S7. The photocurrent and on/off ratio curves of the treated CsPbBr$_3$ flexible PD.

Figure S8. Responsivity and specific detectivity of the treated CsPbBr$_3$ flexible PD.
Figure S9 (a) EQE and (b) spectral response of the treated CsPbBr$_3$ flexible PDs under different biases.

Figure S10. I-t curve of the device bended at 1.02 mm. Even at a deflected condition, the photocurrent response also can be measured with overload bending state.
Figure S11. Comparison of environmental stability of the device kept in air for two months with 35–45% relative humidity. (a) The reproducible I-t curves of the devices measured for periodic light on/off. (b) Absorption spectra of the devices in fresh and kept in air for two months. The inset digital photos show that the CsPbBr$_3$ perovskite is stable even after two months.
Table S1 Performance comparison of our device with other reported CsPbBr$_3$ photodetectors

<table>
<thead>
<tr>
<th>Device structure</th>
<th>Material structure</th>
<th>substrate</th>
<th>Detectivity (Jones)</th>
<th>Rise/ decay time (ms)</th>
<th>Refs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Au/CsPbBr$_3$/Au</td>
<td>Single crystal</td>
<td>None/rigid</td>
<td>$10^{11}$</td>
<td>90.7/57</td>
<td>[1]</td>
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<tr>
<td>Pt/CsPbBr$_3$/Au</td>
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<td>None/rigid</td>
<td>$10^{11}$</td>
<td>230/60</td>
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<tr>
<td>Au/CsPbBr$_3$/Au</td>
<td>Thin film</td>
<td>PET/flexible</td>
<td>$10^{10}$</td>
<td>260/280</td>
<td>This work</td>
</tr>
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</table>

Reference


