Electronic Supplementary Information

Ultrahigh-Detectivity Photodetectors Based on Stabilized All-Inorganic Perovskite $CsPb_{0.922}Sn_{0.078}I_3$ Nanobelts

Zhentao Du[1,2], Dingfa Fu[1,], Tao Yang[2], Zhi Fang[2], Wenna Liu[2], Fengmei Gao[2], Lin Wang[2], Zuobao Yang[2], Jie Teng[1], Hui Zhang[1,*], and Weiyou Yang[2,*]*

[1] College of Materials Science and Engineering, Hunan University, Changsha, 410082, China.

[2] Institute of Materials, Ningbo University of Technology, Ningbo, 315016, China.

[*] Corresponding authors. E-mails: hunu_fudingfa@163.com (D. Fu), zhanghui63hunu@163.com (H Zhang) and weiyouyang@tsinghua.org.cn (W. Yang)

Tel: +86-574-87080966, Fax: +86-574-87081221.

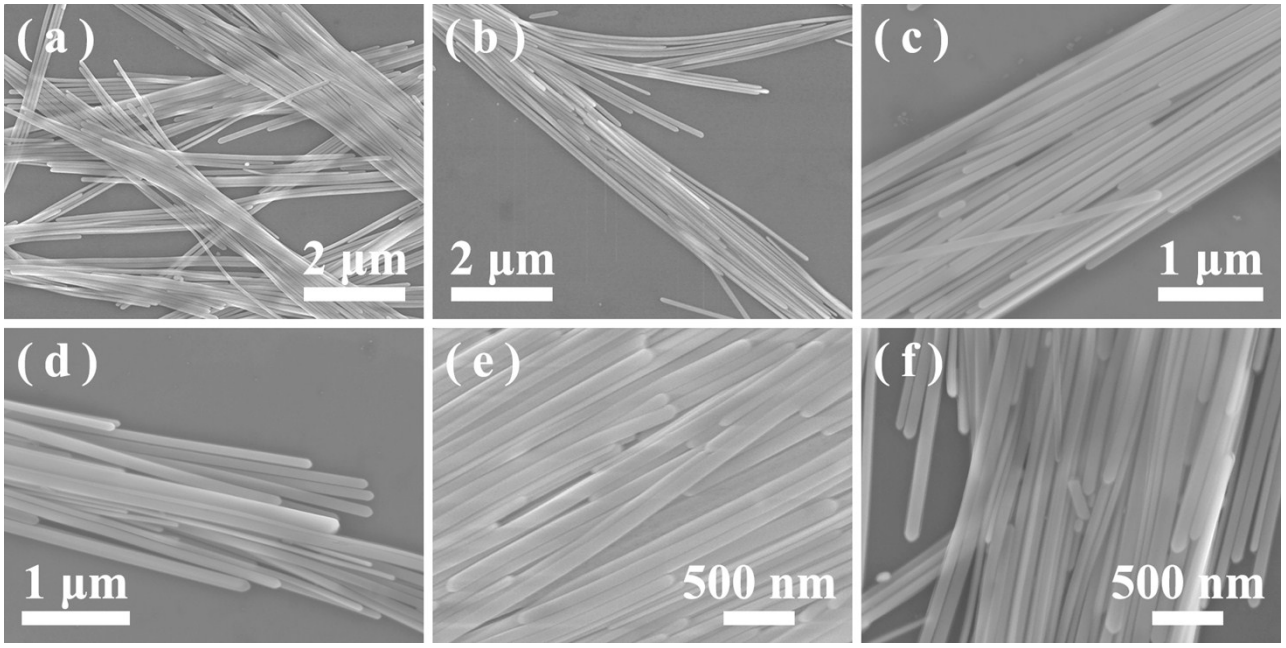

Fig. S1 (a-f) Typical SEM image of as-synthesized $CsPb_{(1-x)}Sn_xI_3$ nanobelts under different magnifications.

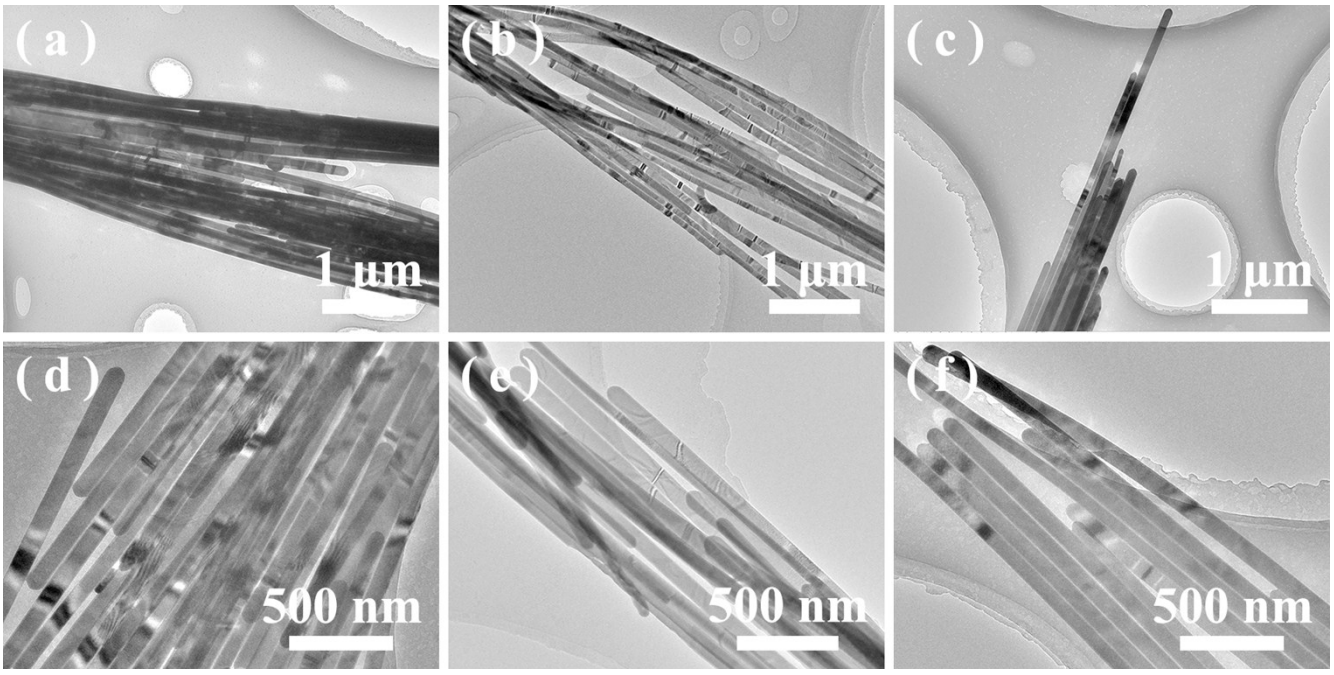

Fig. S2 (a-f) Typical TEM image of the obtained $CsPb_{(1-x)}Sn_xI_3$ nanobelts under different magnifications.

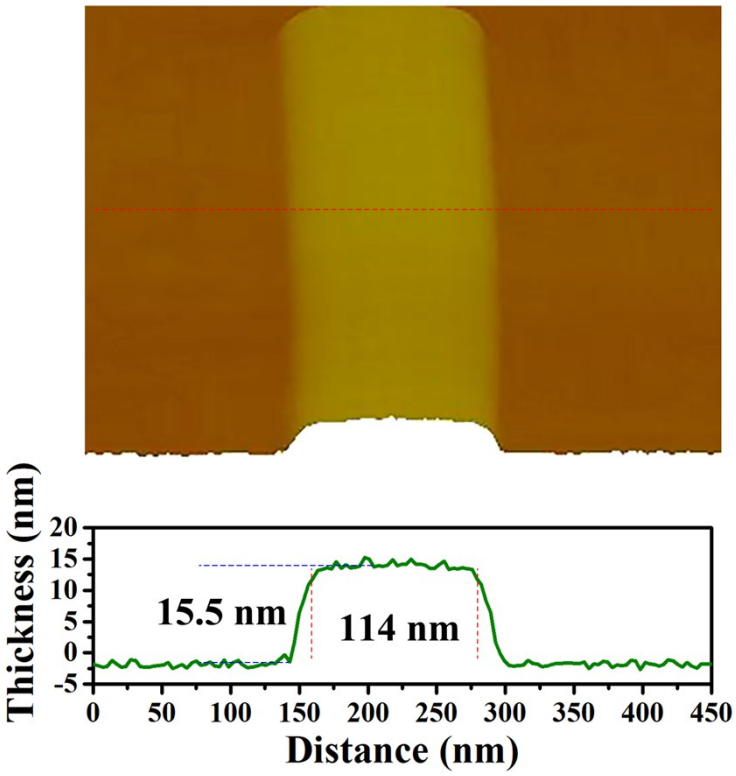

Fig. S3 The AFM image of as-synthesized $CsPb_{(1-x)}Sn_xI_3$ nanobelts and its line scanning taken through the dashed line on the topography image.

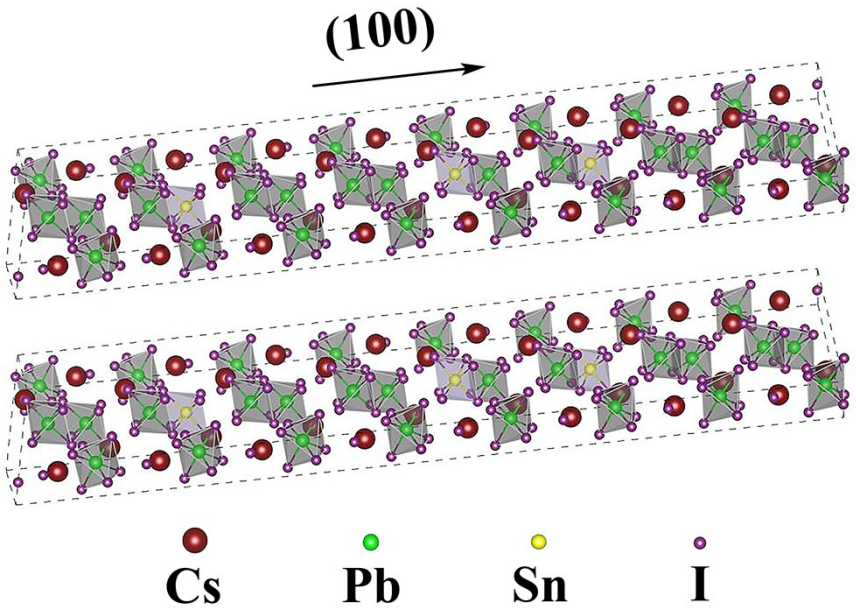

Fig. S4 The crystal structure of the as-grown $CsPb_{(1-x)}Sn_xI_3$ nanobelts.

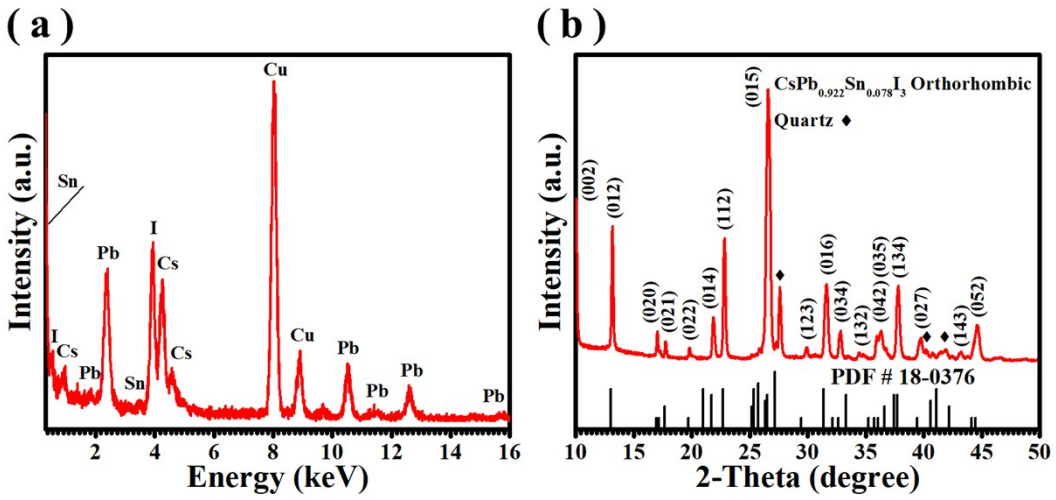

Fig. S5 (a-b) Typical EDX spectrum and XRD pattern of $CsPb_{(1-x)}Sn_xI_3$ nanobelts.

Table. S1 The detailed compostions of Pb and Sn within $CsPb_{(1-x)}Sn_xI_3$ nanobelts.

Pb (atom.%)	Sn (atom.%)	$CsPb_{(1-x)}Sn_xI_3$ (x=)
92.2	7.8	0.078

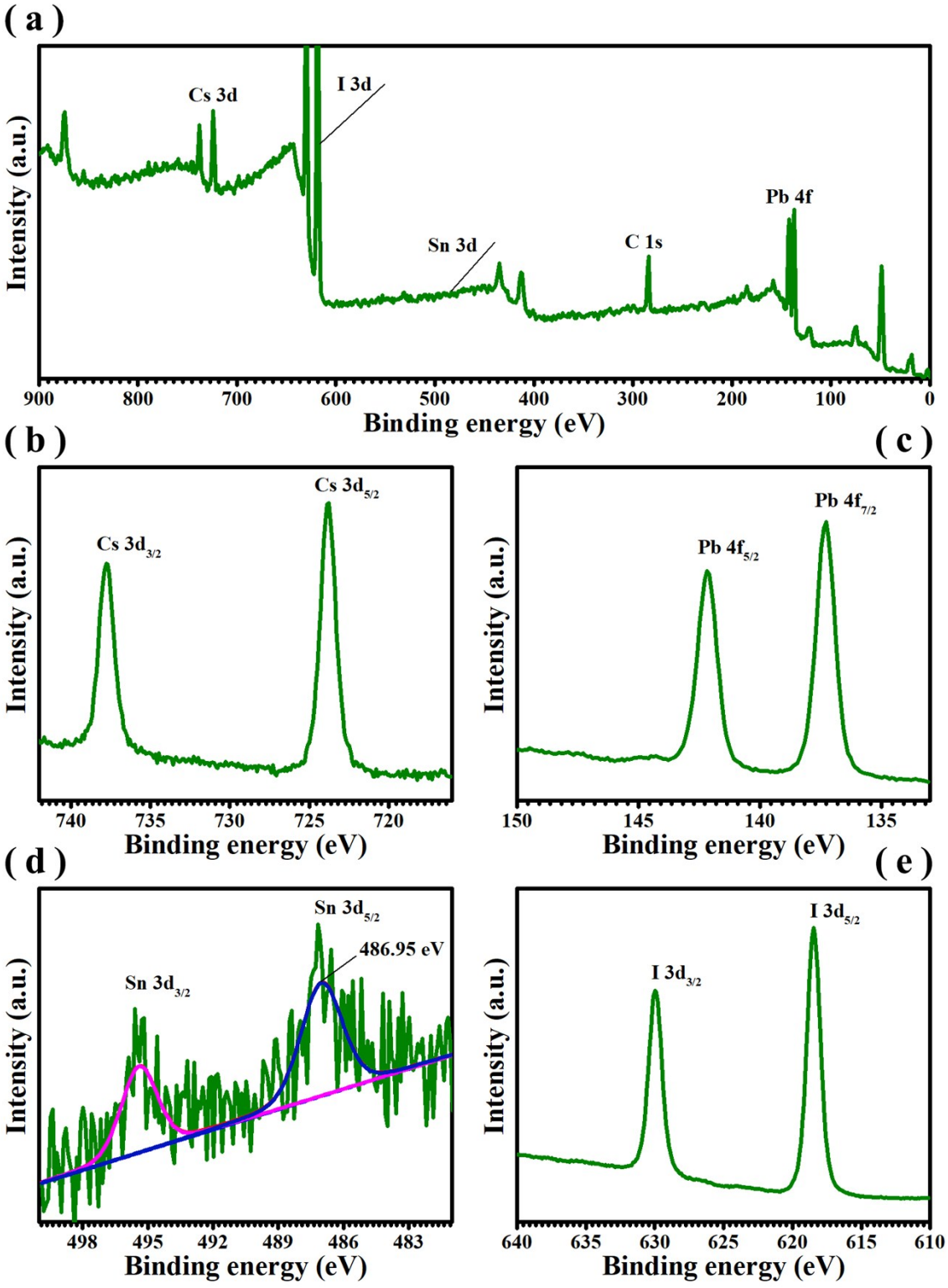

Fig. S6 Representative XPS spectra of the $CsPb_{0.922}Sn_{0.078}I_3$ nanobelts after maintaining for 15 days under air conditions: (a) survey spectrum, (b) core level spectrum for Cs 3d, (c) core level spectrum for Pb 4f, (d) core level spectrum for Sn 3d, (e) core level spectrum for I 3d.