

## Electronic Supplementary Information

### Lead-free and Amorphous Organic–Inorganic Hybrid Materials for Photovoltaic Applications: Mesoscopic $\text{CH}_3\text{NH}_3\text{MnI}_3/\text{TiO}_2$ Heterojunction

Xianxi Zhang<sup>a\*</sup>, Jie Yin<sup>a</sup>, Zhonghao Nie<sup>a</sup>, Qian Zhang<sup>a</sup>, Ning Sui<sup>b</sup>, Baoli Chen<sup>a</sup>, Yingtian Zhang<sup>a</sup>, Konggang Qu<sup>a</sup>, Jinsheng Zhao<sup>a</sup>, Huawei Zhou<sup>a\*</sup>

<sup>a</sup> Shandong Provincial Key Laboratory of Chemical Energy Storage and Novel Cell Technology, School of Chemistry and Chemical Engineering, Liaocheng University; College of Materials Science and Engineering, Liaocheng University; Liaocheng 252059, China.

<sup>b</sup> College of Materials Science and Engineering, Qingdao University of Science and Technology, Qingdao 266042, China

\* Corresponding authors: E-mail: zhouhuaweiopv@163.com; E-mail: [xxzhang3@126.com](mailto:xxzhang3@126.com)

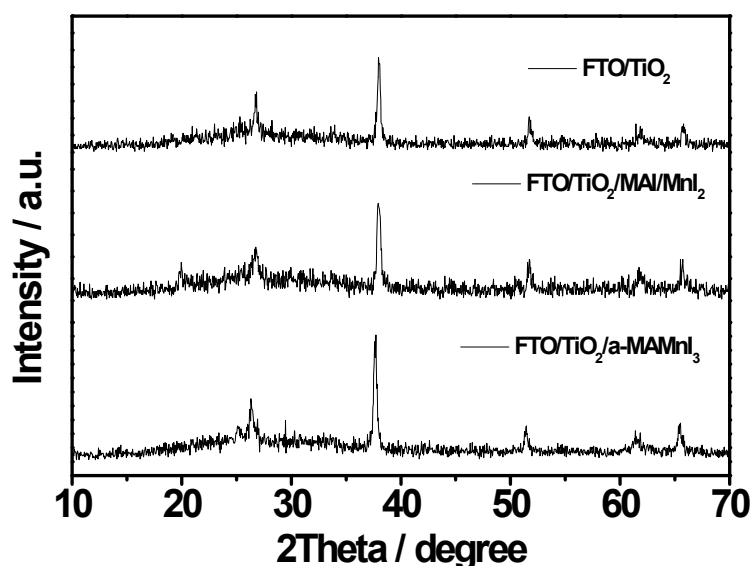
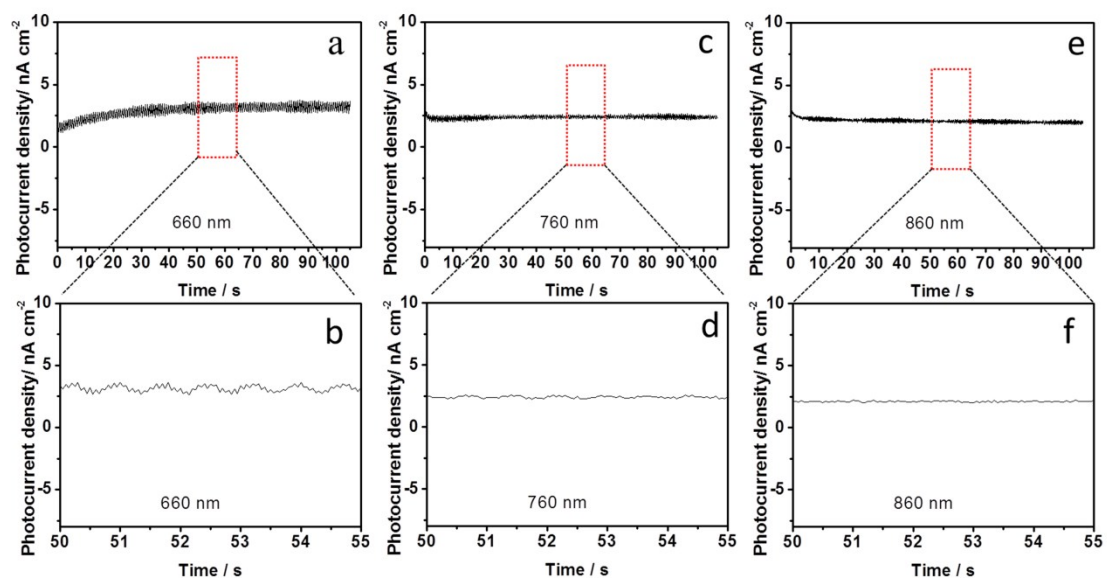


Figure S1 XRD of FTO/TiO<sub>2</sub>; FTO/TiO<sub>2</sub>/MAI/MnI<sub>2</sub>; FTO/TiO<sub>2</sub>/a-MAMnI<sub>3</sub>



**Figure S2** Photocurrent-time characteristics of the FTO/ETL-TiO<sub>2</sub>/a-MAMnI<sub>3</sub>/Spiro-MeOTAD/Ag device under different wavelengths (600, 760 and 860 nm) with 1.33 Hz chopping frequency.