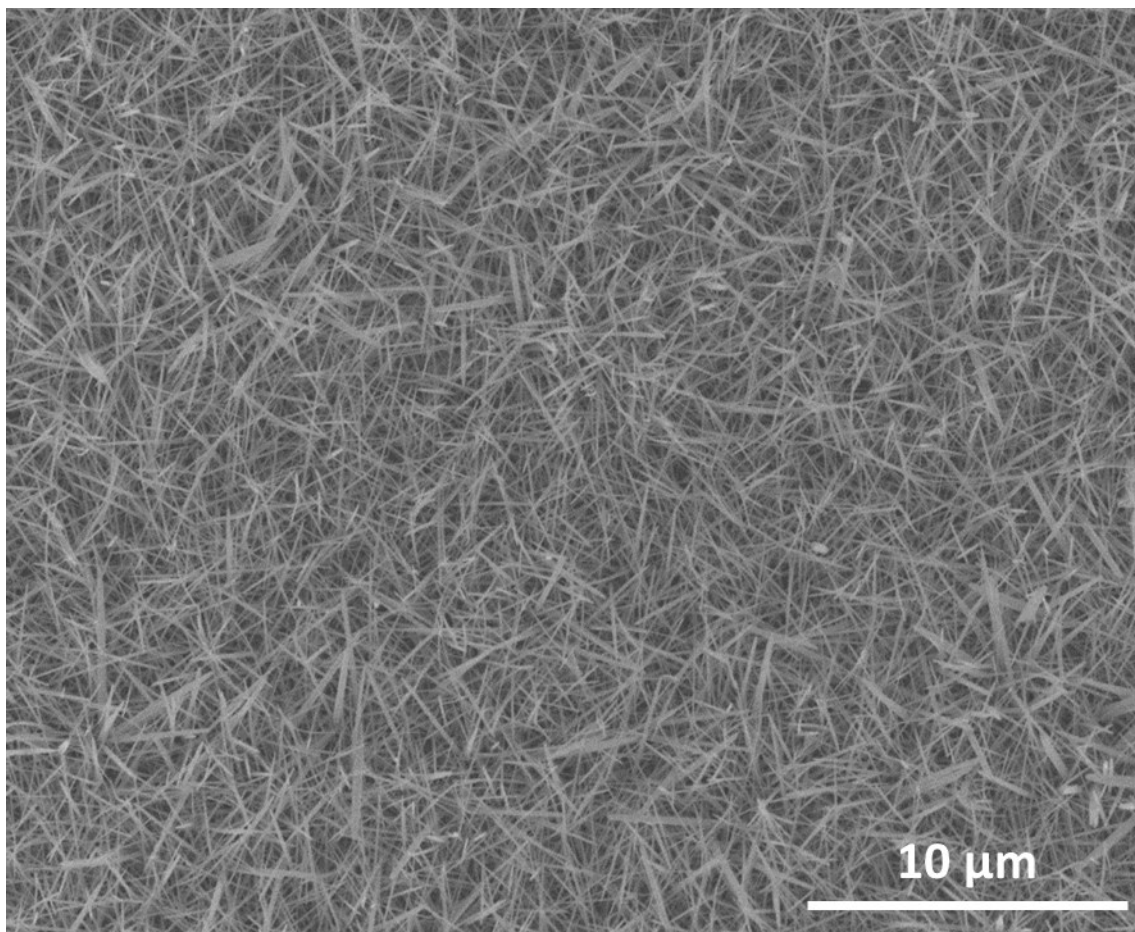


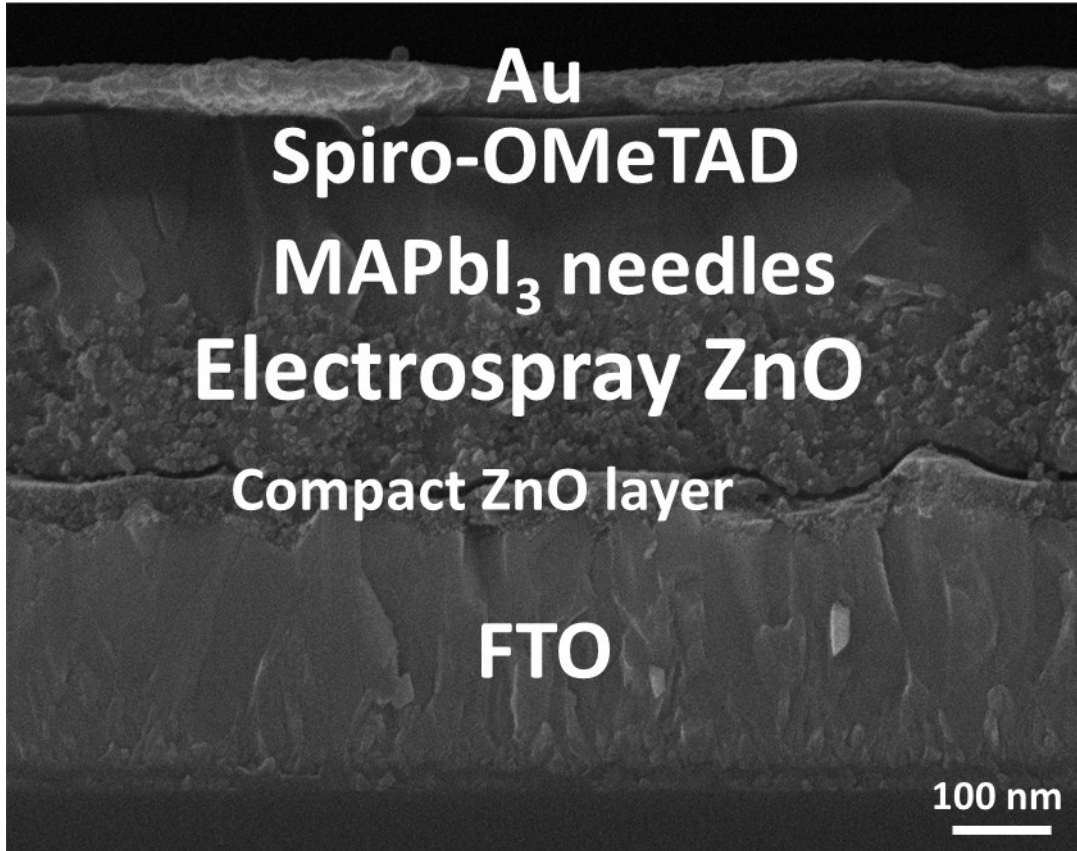
## **Supporting Information**

**for**

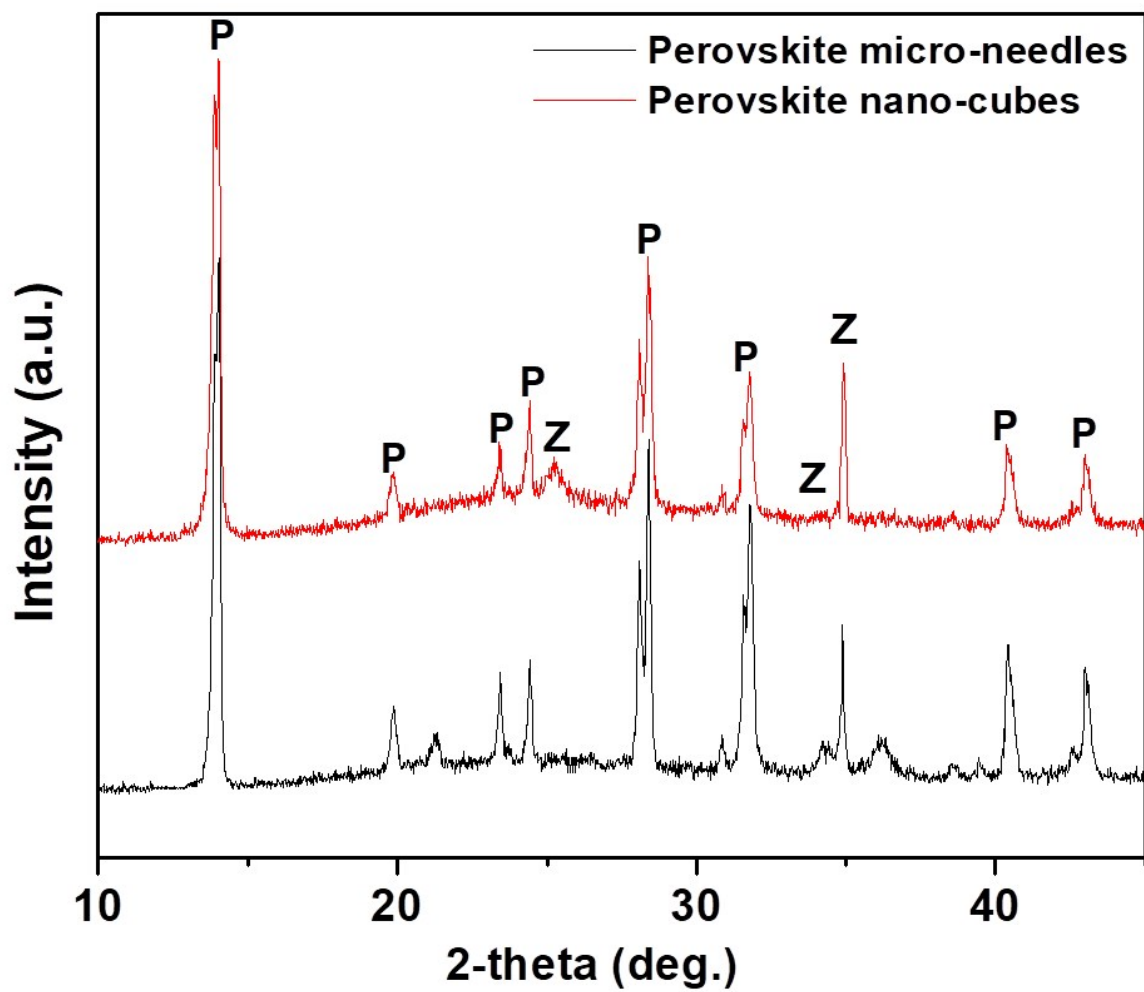
**MAPbI<sub>3</sub> microneedle-arrays for perovskite photovoltaic application**



**Fig. S1** Top-view low resolution SEM image of  $\text{PbI}_2$  microneedles grown by hydrothermal method.



**Fig. S2** Cross-sectional SEM images of complete cell based on MAPbI<sub>3</sub> microneedles.



**Fig. S3** Comparison of XRD patterns of perovskite solar cells based on MAPbI<sub>3</sub> microneedles and nano-cubes. Peaks related to the ZnO and perovskite are marked (Z is for ZnO and P is for perovskite structure).

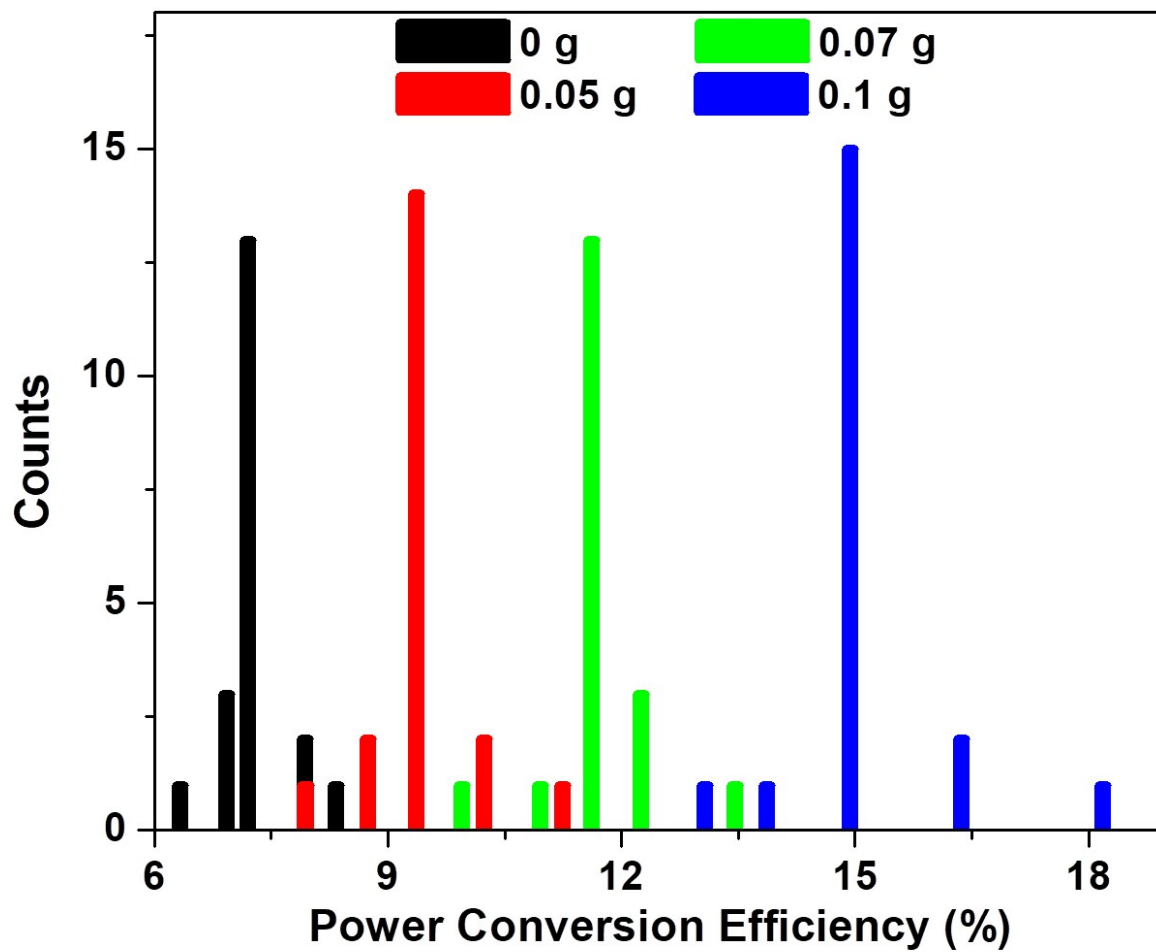


Fig. S4. Bar-graphs showing the statistics of PCE at different CTAB concentration