

Supplementary information

Improved air stability of perovskite hybrid solar cells via blending of poly(dimethylsiloxane)-Urea copolymer

Wanchun Xiang,^{a*} Qi Chen,^a Yiyuan Wang,^a Meijin Liu,^b Fuzhi Huang,^c Tongle Bu,^c Taishan Wang,^d Yi-Bing Cheng,^{c,e} Xiao Gong,^a Jie Zhong,^c Peng Liu,^b Xi Yao^{b*} and Xiujian Zhao^a

^a State key laboratory of silicate materials for architecture, Wuhan University of Technology, Luoshi Road, Wuhan, China, 430070, xiangwanchun@whut.edu.cn

^b Department of Biomedical Sciences, City University of Hong Kong, Hong Kong, P. R. China, xi.yao@cityu.edu.hk

^c State key laboratory of advanced technologies for materials synthesis and processing, Wuhan University of Technology, Luoshi Road, Wuhan, China, 430070

^d Centre for Beijing Molecular Science National Laboratory, Institute of Chemistry, Chinese Academy of Sciences, Zhongguancunbeiyijie 2 hao, Beijing, China, 100190

^e Department of Materials Science and Engineering, Monash University, Clayton, Vic 3800 Australia

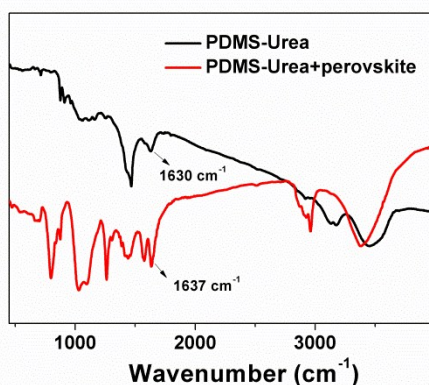


Fig. S1 FTIR spectra of the perovskite films with and without PDMS-Urea additive.

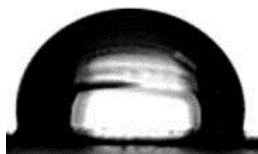


Fig. S2 Contact angle measurement of the PDMS-Urea membrane on top of FTO glass substrate.

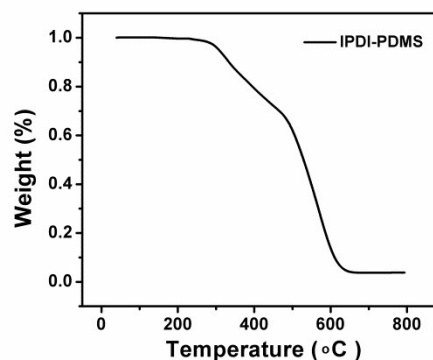


Fig. S3 TGA measurement of PDMS-Urea

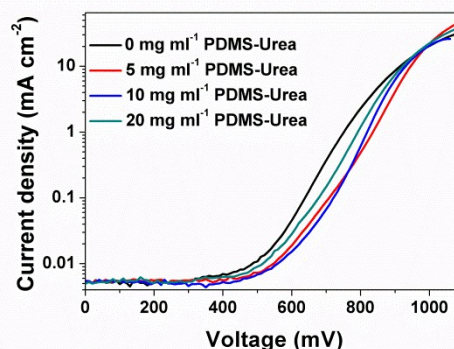
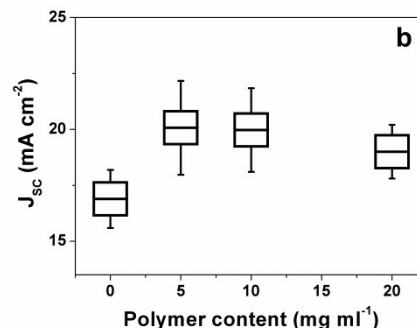
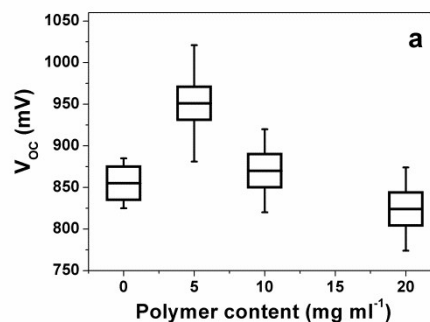


Fig. S4 Dark current of perovskite solar cells with and without PDMS-Urea additive



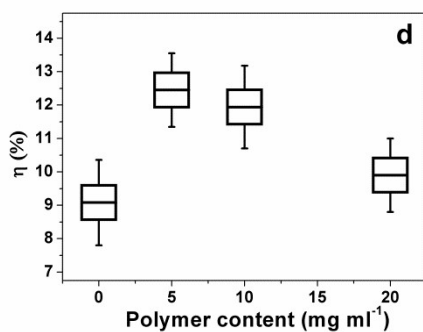
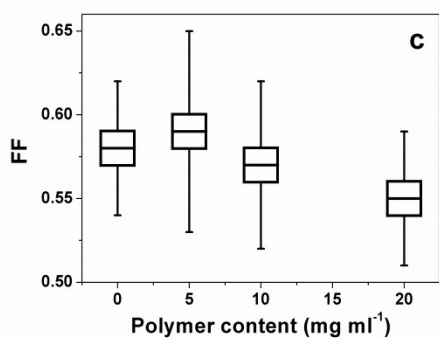


Fig. S5 Statistics analysis of box charts of (a) Voc, (b) Jsc, (c) FF, and (d) PCE for perovskite solar cells with various concentrations of PDMS-Urea.

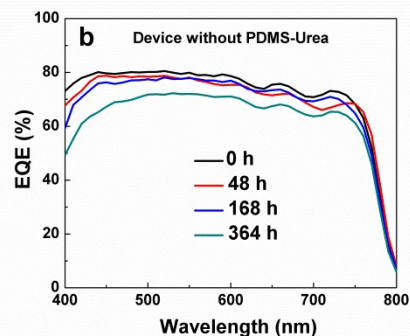
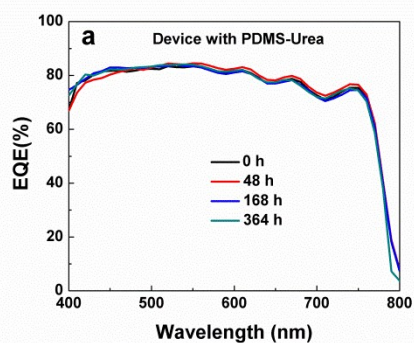


Fig.S7 The evolution of IPCE of the devices with (a) and without (b) 10 mg ml⁻¹ PDMS-Urea additive in the perovskite films along time.

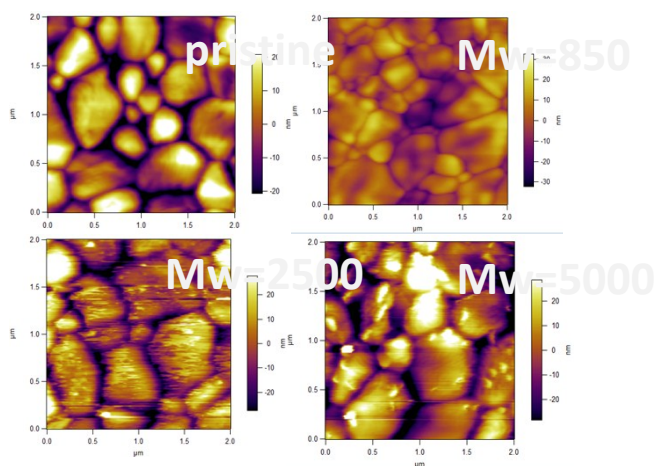


Fig. S6 AFM images of the perovskite films with PDMS-Urea additive with different molecular weight.

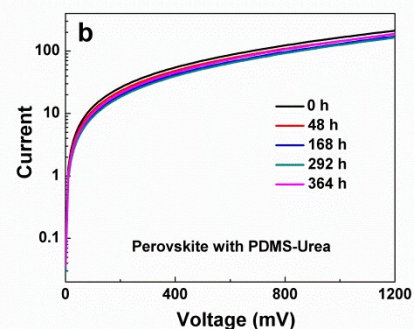
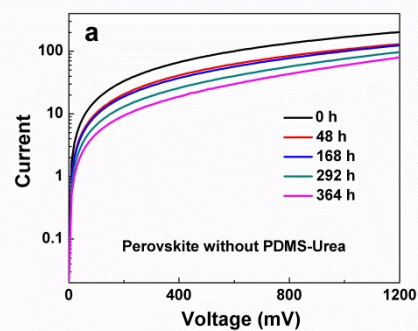


Fig.S8 The evolution of conductivity of the perovskite films without (a) and with (b) 10 mg ml⁻¹ PDMS-Urea additive along time.