Supporting Information

Ultrathin TiO_2 Blocking Layers via Atomic Layer Deposition toward High-Performance Dye-Sensitized Photo-Electrosynthesis Cells

Xiaodan Zhang [1,2], Lei Lei [2], Xinpeng Wang[1,*] and Degao Wang[2,*]

[1] State Key Laboratory of Featured Metal Materials and Life-cycle Safety for Composite Structures, School of Resources, Environment and Materials, Guangxi University, Nanning 530004, P.R. China

[2] Engineering Laboratory of Advanced Energy Materials, Ningbo Institute of Materials Technology and Engineering Chinese Academy of Sciences, Ningbo 315201, P.R. China

* Correspondence: wangxinpeng@gxu.edu.cn and wangdegao@nimte.ac.cn

Supplementary results

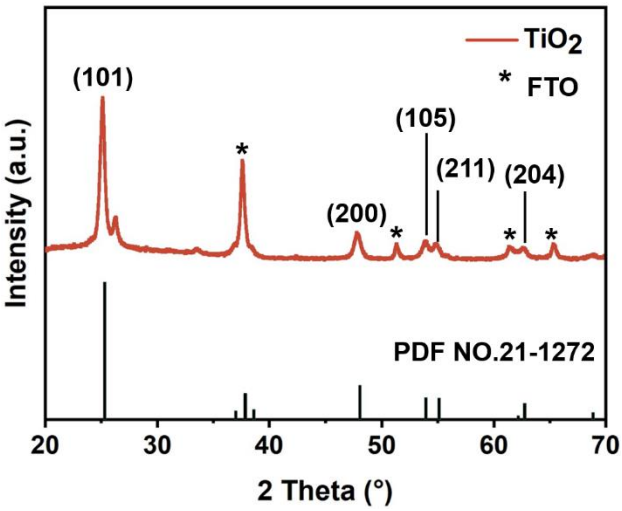

Figure S1. X-ray diffraction pattern of TiO_2.

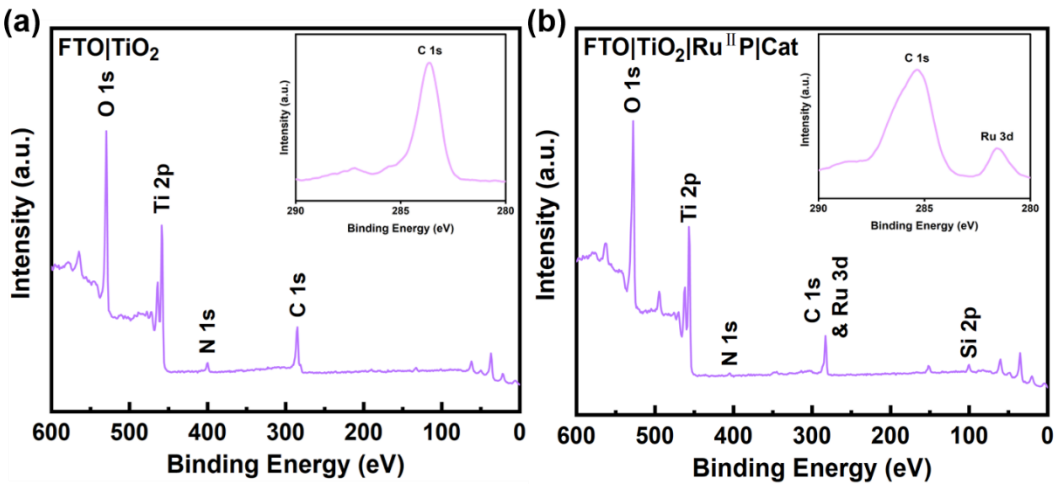

Figure S2. XPS spectra of (a) FTO| TiO_2 and (b) FTO| TiO_2| $Ru^{II}P$| Cat. Inset is (a) the region of C 1s and (b) the region of C 1s & Ru 3d.

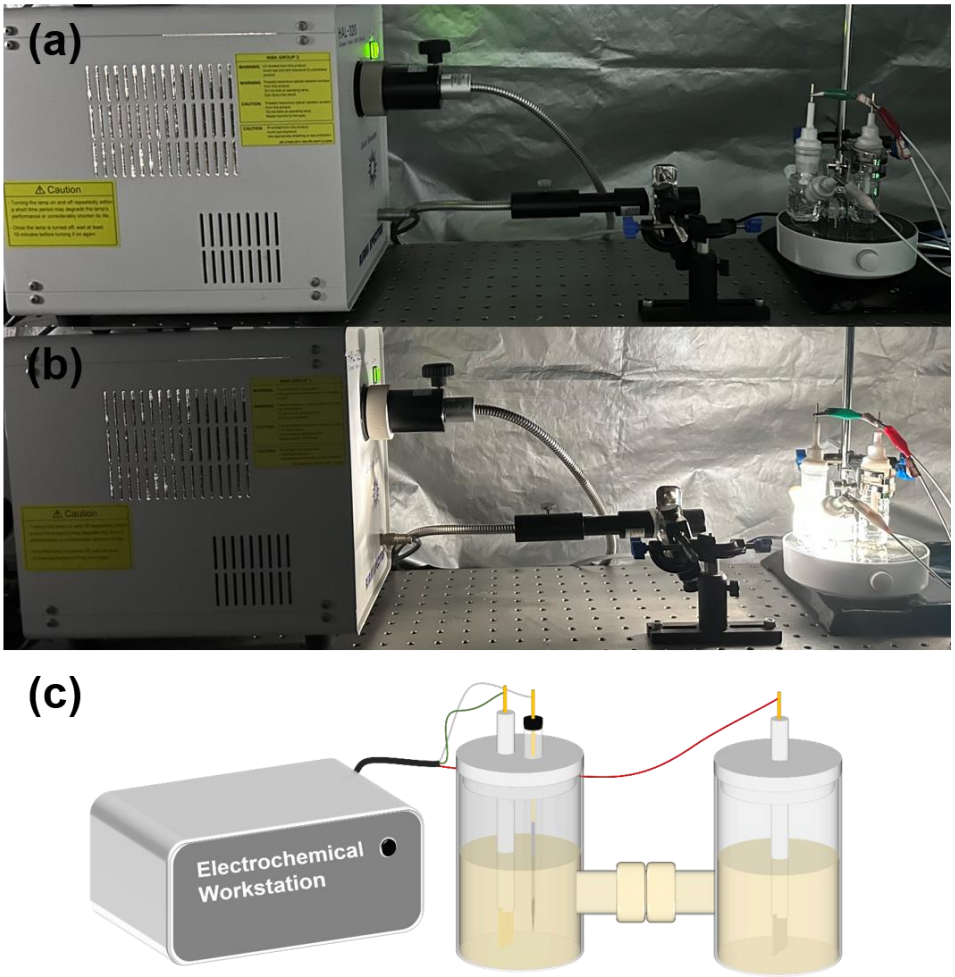

Figure S3. (a) Experimental physical picture under dark conditions, (b) Experimental physical picture under light irradiation and (c) The diagram of experimental setup.

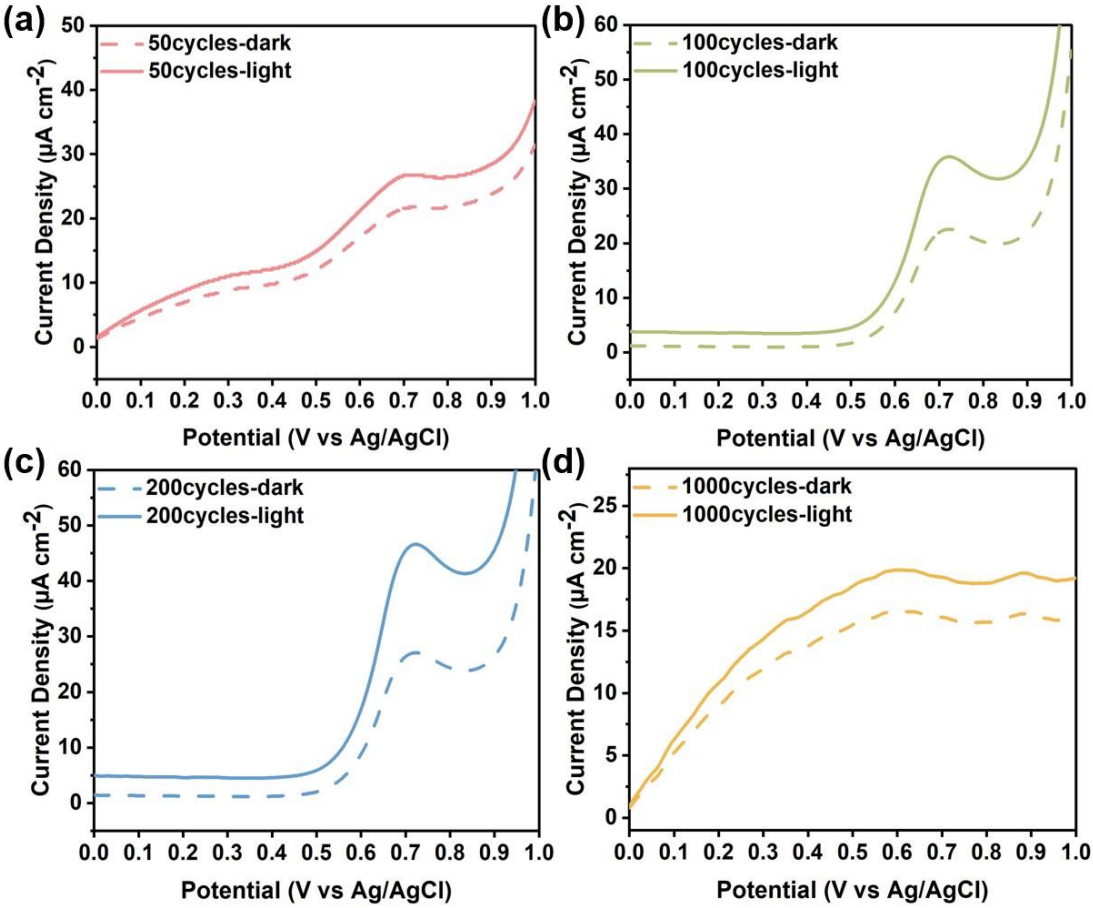

Figure S4.LSV for electrodes with 50(a), 100(b), 200(c) and 1000(d) cycles of BL under dark and irradiation conditions, ν = 50 mV s^{-1}.

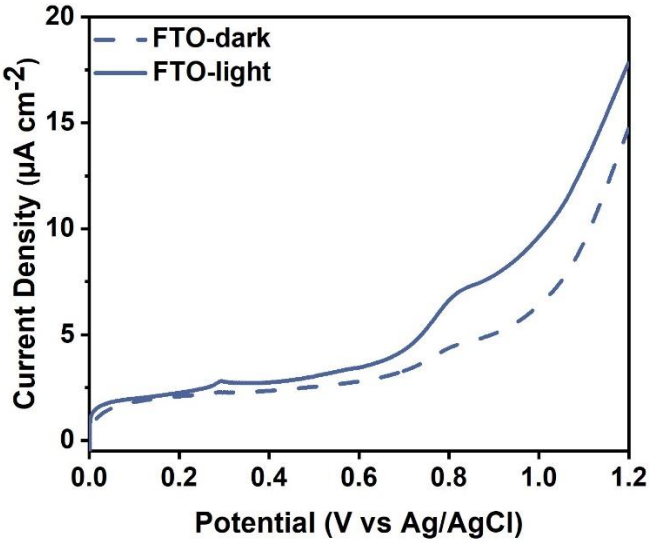

Figure S5. Linear sweep voltammograms for FTO under dark and irradiation conditions.

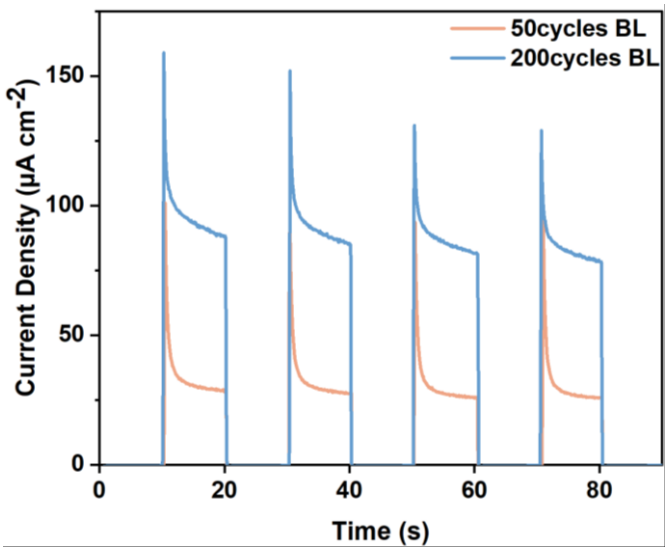

Figure S6. Chronoamperometry of the photocurrent over 90 s dark–light cycles for water oxidation by FTO|TiO_2|Ru^{II}P|Cat of 50 cycles BLs (pink) and FTO|TiO_2|Ru^{II}P|Cat of 200 cycles BLs (blue).

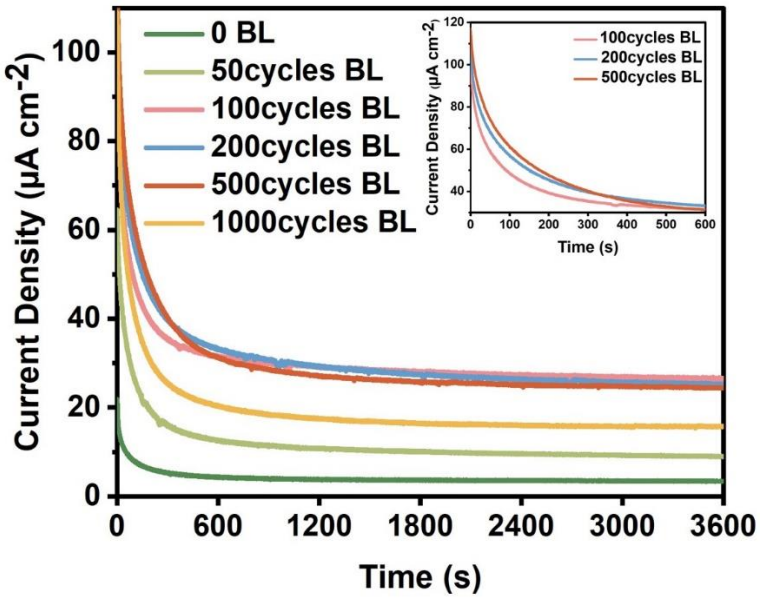

Figure S7. Stability curve of the electrodes within one hour under light illumination.

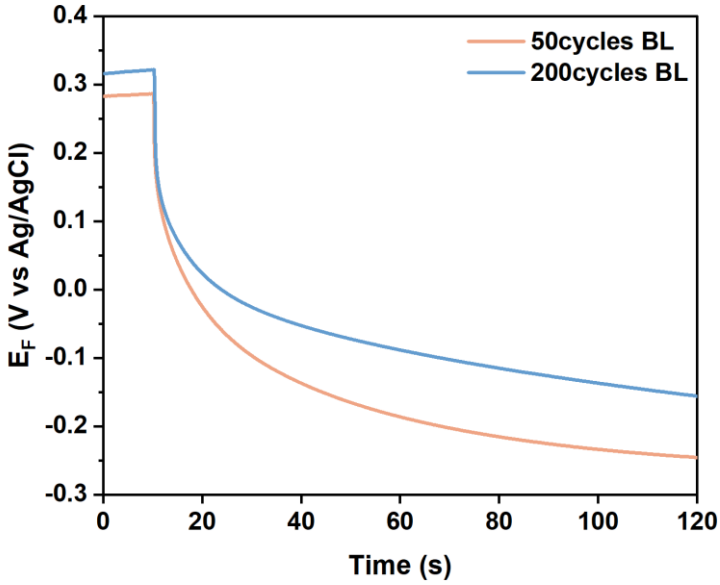

Figure S8. Open-circuit voltage decays for DSPECs of 50 cycles BLs(pink) and 200 cycles BLs(blue).

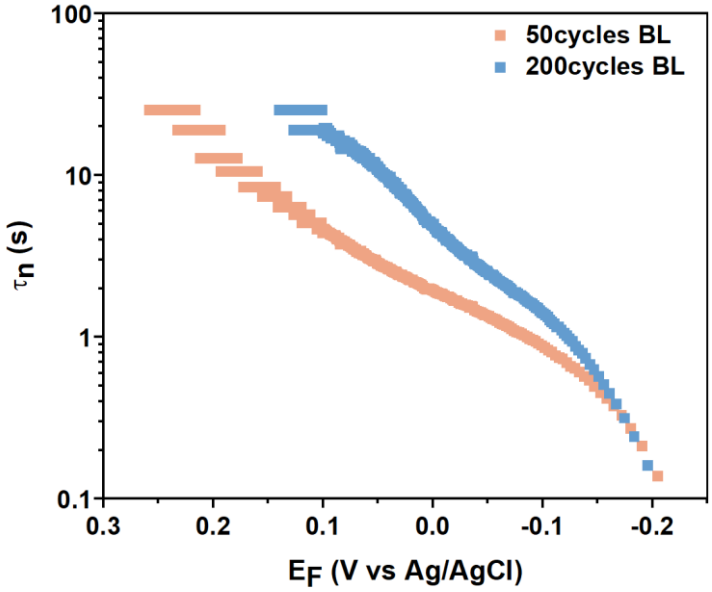

Figure S9. Electron lifetime curves for DSPECs of 50 cycles BLs(pink) and 200 cycles BLs(blue).

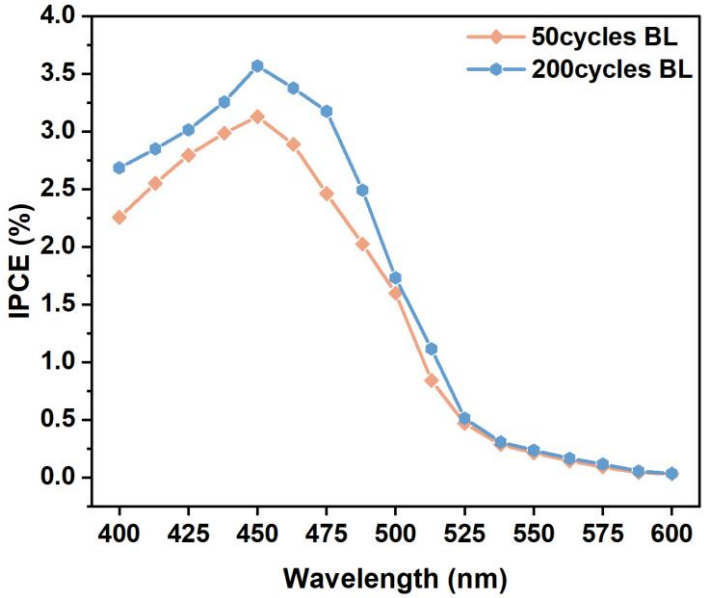

Figure S10. IPCE profiles for DSPECs of 50 cycles BLs (pink) and 200 cycles BLs (blue).