Electronic Supplementary Information for

Pulse laser deposited n-Si/NiO_x photoanodes for stable and efficient photoelectrochemical water splitting

Lingyun He,[a] Wu Zhou,[a] Dongping Cai,[a] Samuel S. Mao,[bc] Ke Sun*[de] and Shaohua Shen*[af]

[a]International Research Center for Renewable Energy, State Key Laboratory of Multiphase Flow in Power Engineering, Xi'an Jiaotong University, Xi'an, Shaanxi 710049, China. E-mail addresses: shshen_xjtu@mail.xjtu.edu.cn.
[b]Samuel Mao Institute of New Energy, Shenzhen, Guangdong 518031, China.
[c]Department of Mechanical Engineering, University of California at Berkeley, Berkeley, CA 94720, USA.
[d]Joint Center for Artificial Photosynthesis, California Institute of Technology, Pasadena, CA 91125, USA.
[e]Division of Chemistry and Chemical Engineering, California Institute of Technology, Pasadena, CA 91125, USA. E-mail addresses: kesun@caltech.edu.
[f]Xi'an Jiaotong University Suzhou Academy, Suzhou, Jiangsu 215123, China.

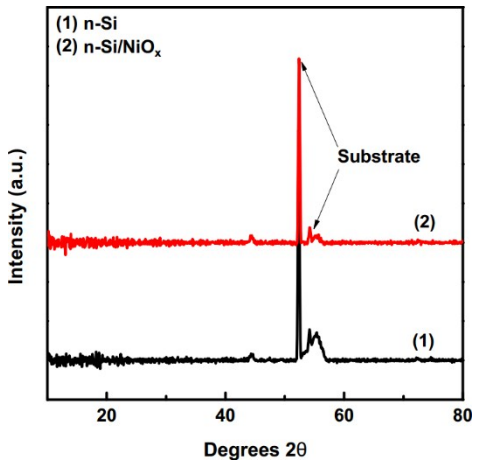

Fig. S1. Grazing incidence XRD patterns of the n-Si and n-Si/NiO_x films.

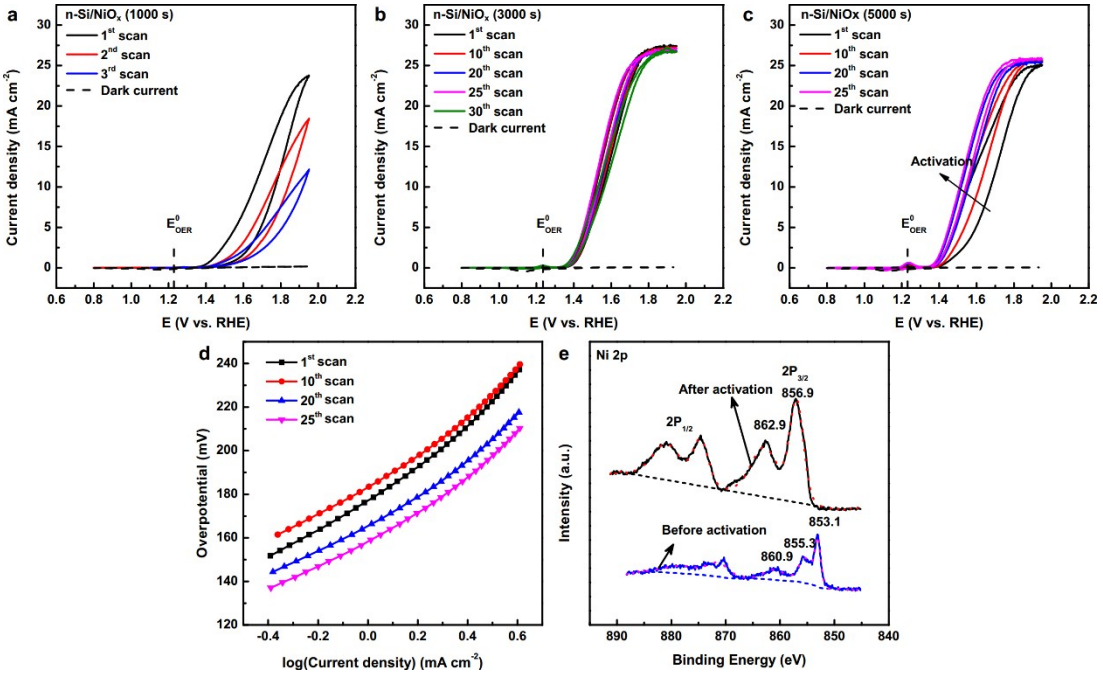

Fig. S2. (a-c) The electrochemical activation behaviors of NiO_x deposited n-Si by PLD with different thickness (a: 1000 s, b: 3000 s and c: 5000 s). (d) Tafel plots of the n-Si/NiO_x (5000 s) photoanode with different activation scan cycles. (e) The Ni 2p XPS spectra of the n-Si/NiO_x (5000 s) photoanode before and after electrochemical activation. All CV measurements (20 mV s^{-1}) were scanned in 1.0 M NaOH (aq) at room temperature.

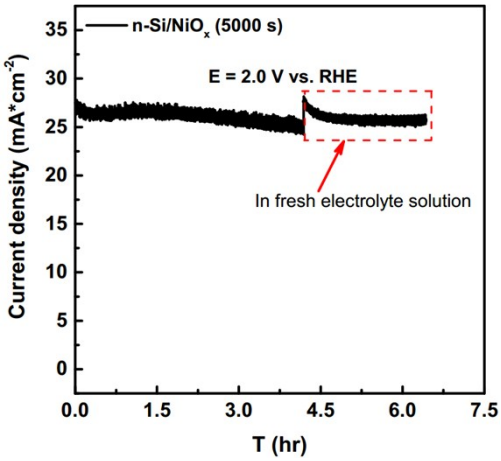

Fig. S3. Chronoamperometry of an n-Si/NiO_x (5000 s) photoanode held at 2 V vs. RHE in 1.0 M NaOH (aq). The illumination intensity was 1.0 Sun.