Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Appendix A. Supporting Information

Synergistic Effect of Valence Bond Environment and Exposed Crystal Facets of TiO_2/SnS_2 Heterojunction for Achieving Enhanced Electrocatalytic Oxygen Evolution

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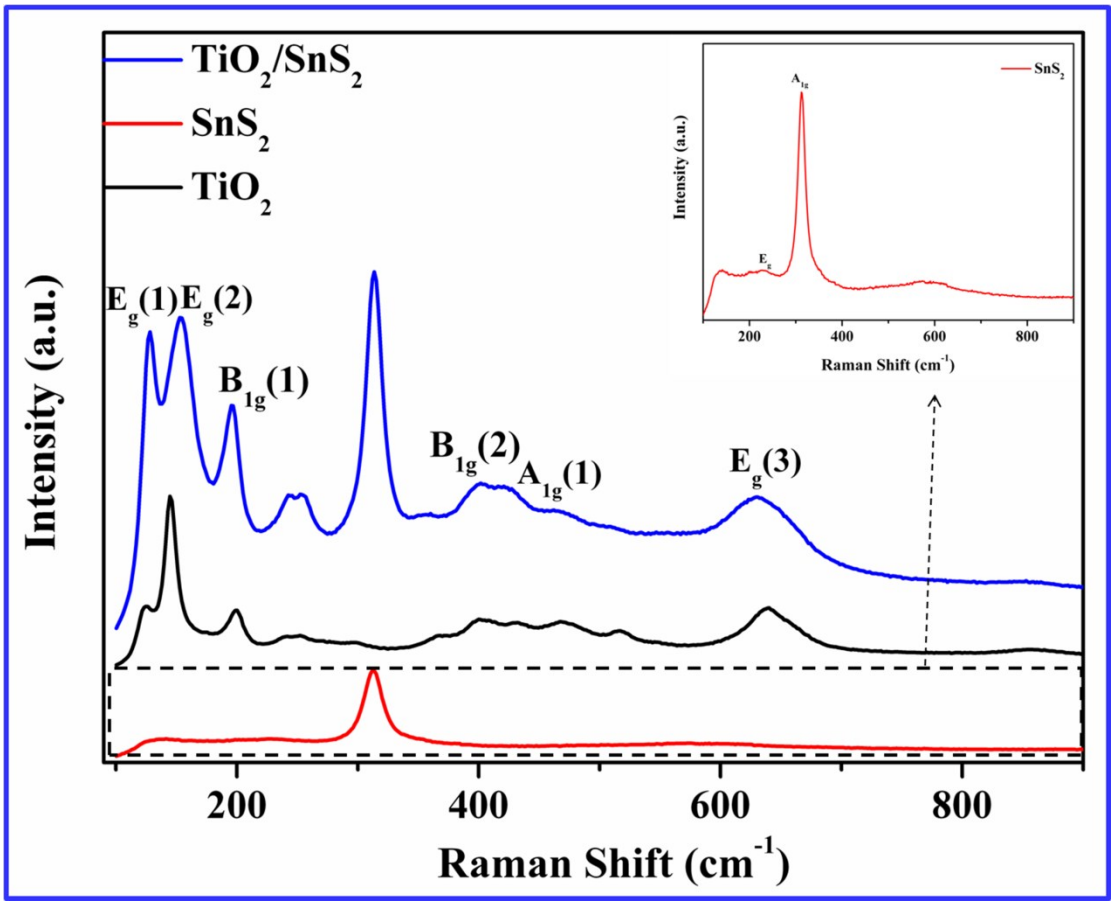


Figure S1. Raman spectra of TiO_2, SnS_2 and TiO_2/SnS_2.

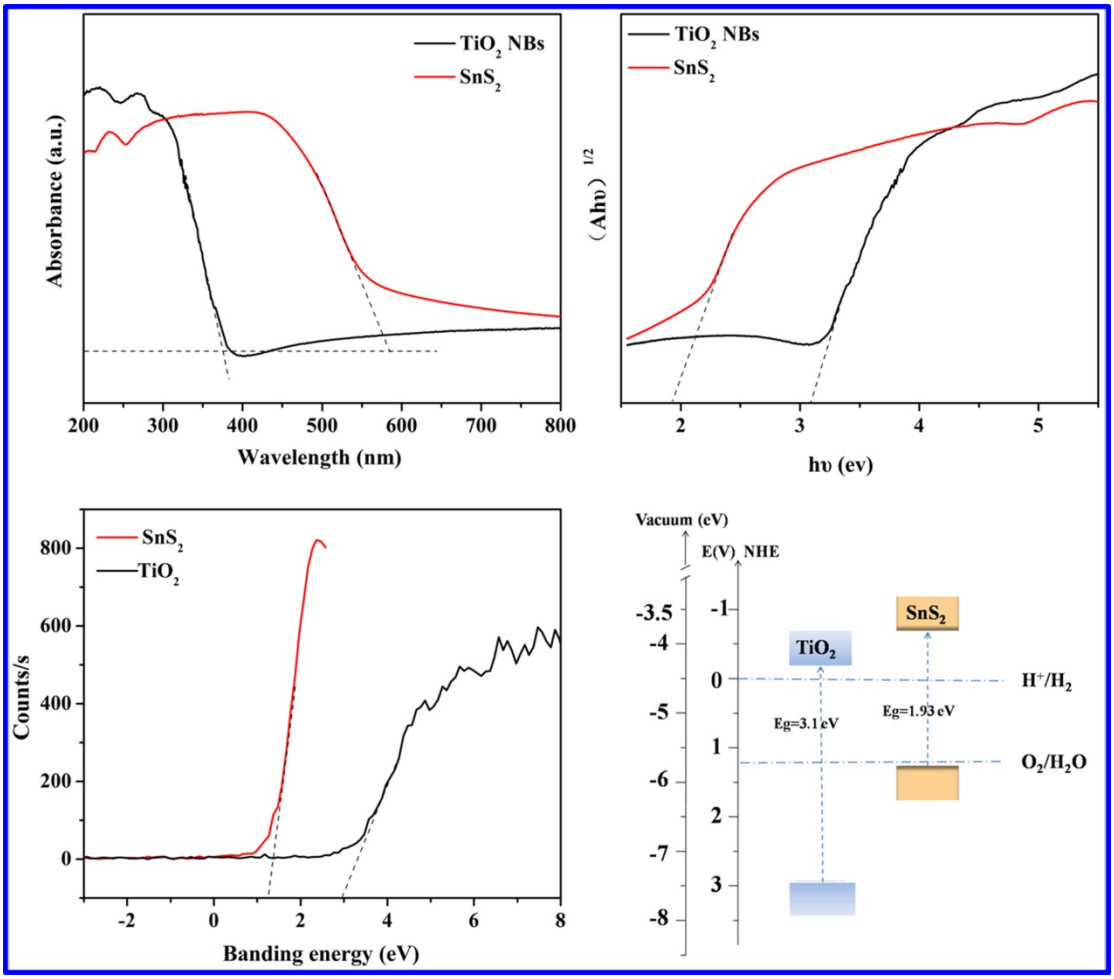


Figure S2. UV–visible diffuse reflectance spectra (a) and curves of the Kubelka-Munk function plotted against the photon energy of corresponding samples (b); Valance band spectra (c) and Energy band structure (d) of TiO_2, SnS_2, and TiO_2/SnS_2.

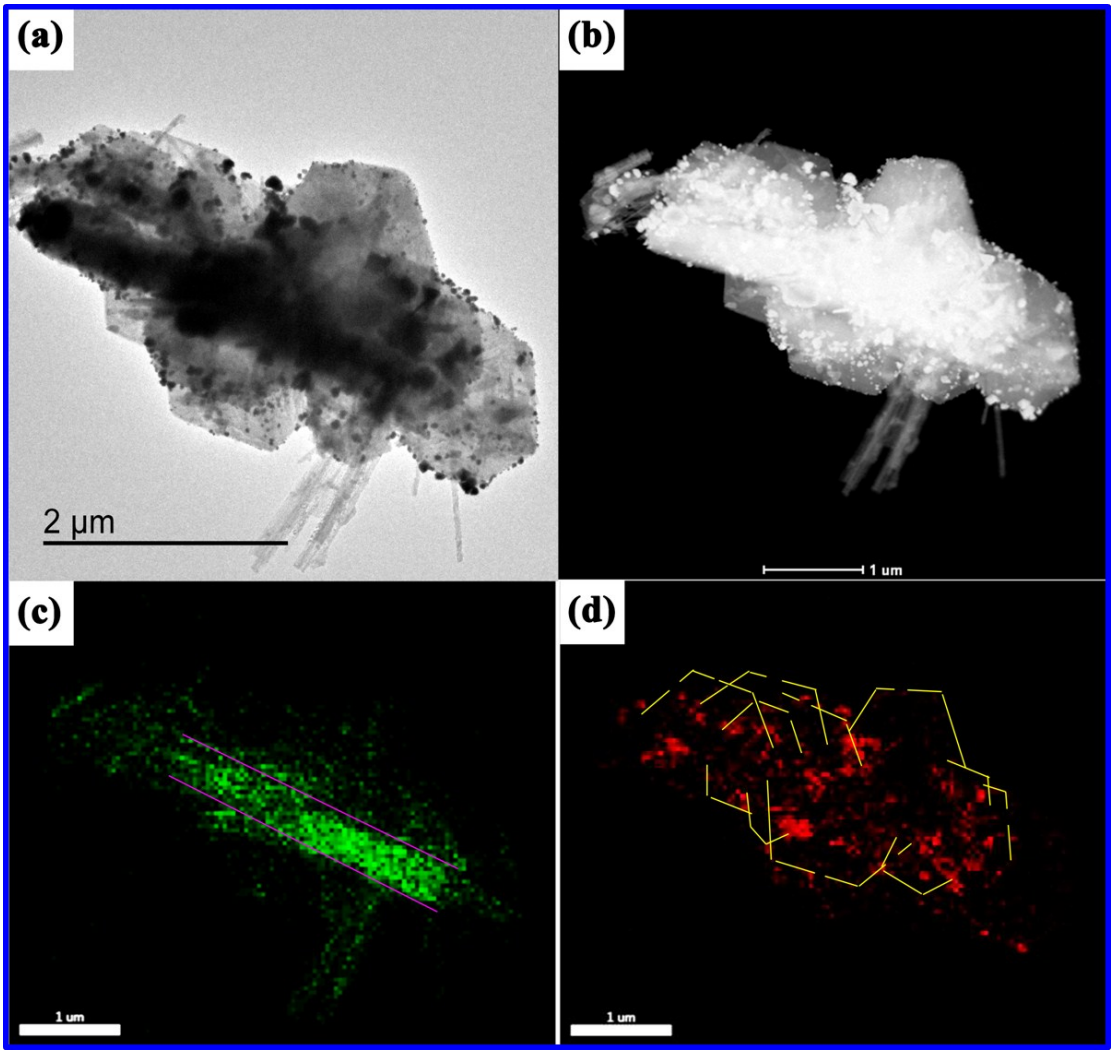


Figure S3. TEM image of TiO_2/SnS_2@Au in low magnification (a) EDX spectrum (b) and Ti (c) and Au (d) elemental mapping of TiO_2/SnS_2@Au.

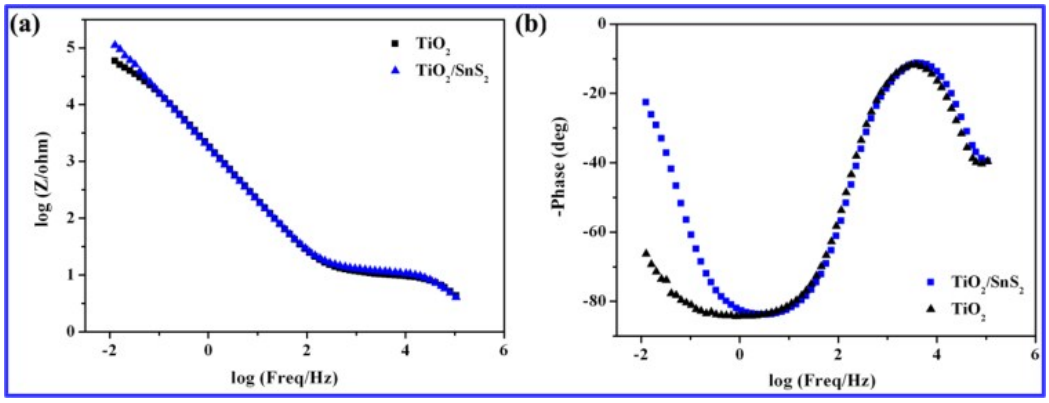


Figure S4. (a) Bode-Impedance and (b) Bode-Phase angle plots of TiO_2 and TiO_2/SnS_2.

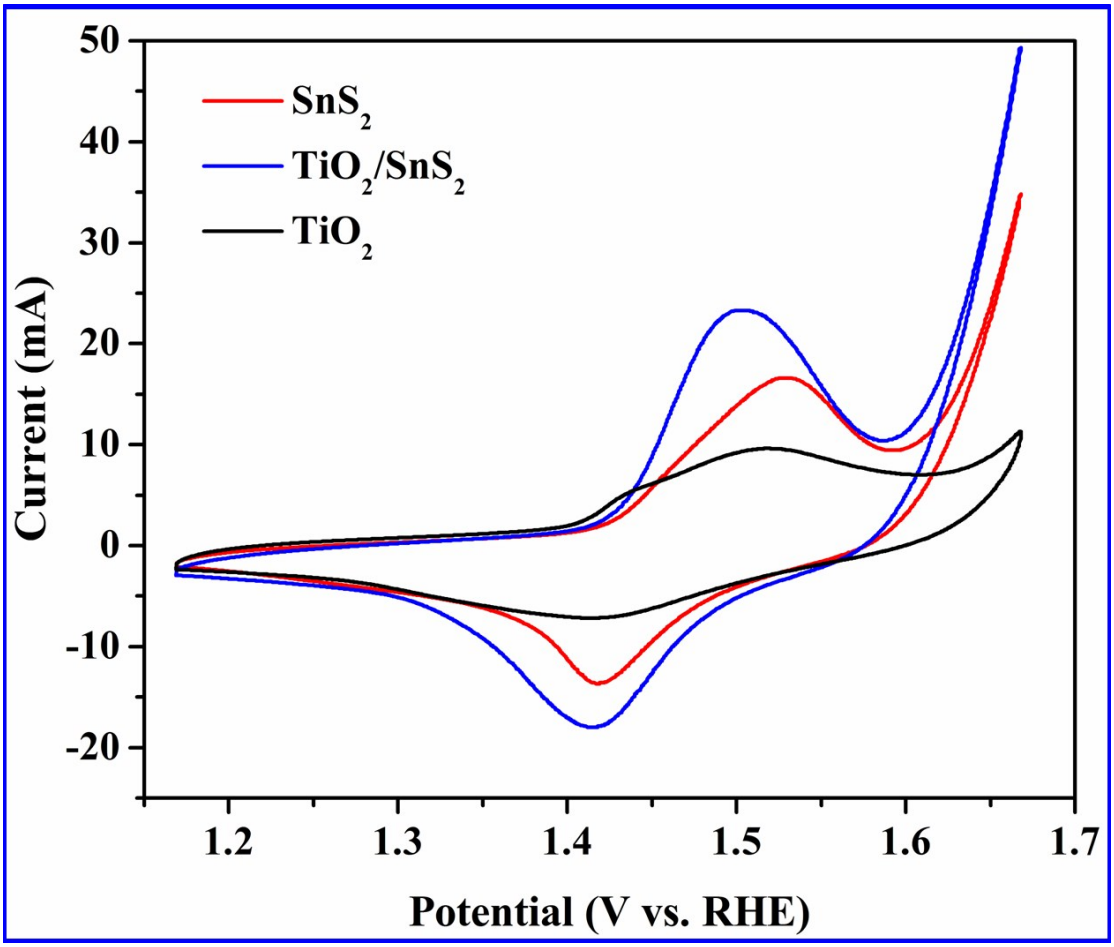


Figure S5. CV curves of TiO_2, SnS_2 and TiO_2/SnS_2 collected with a scan rate of 100 mV/s in 1M NaOH.

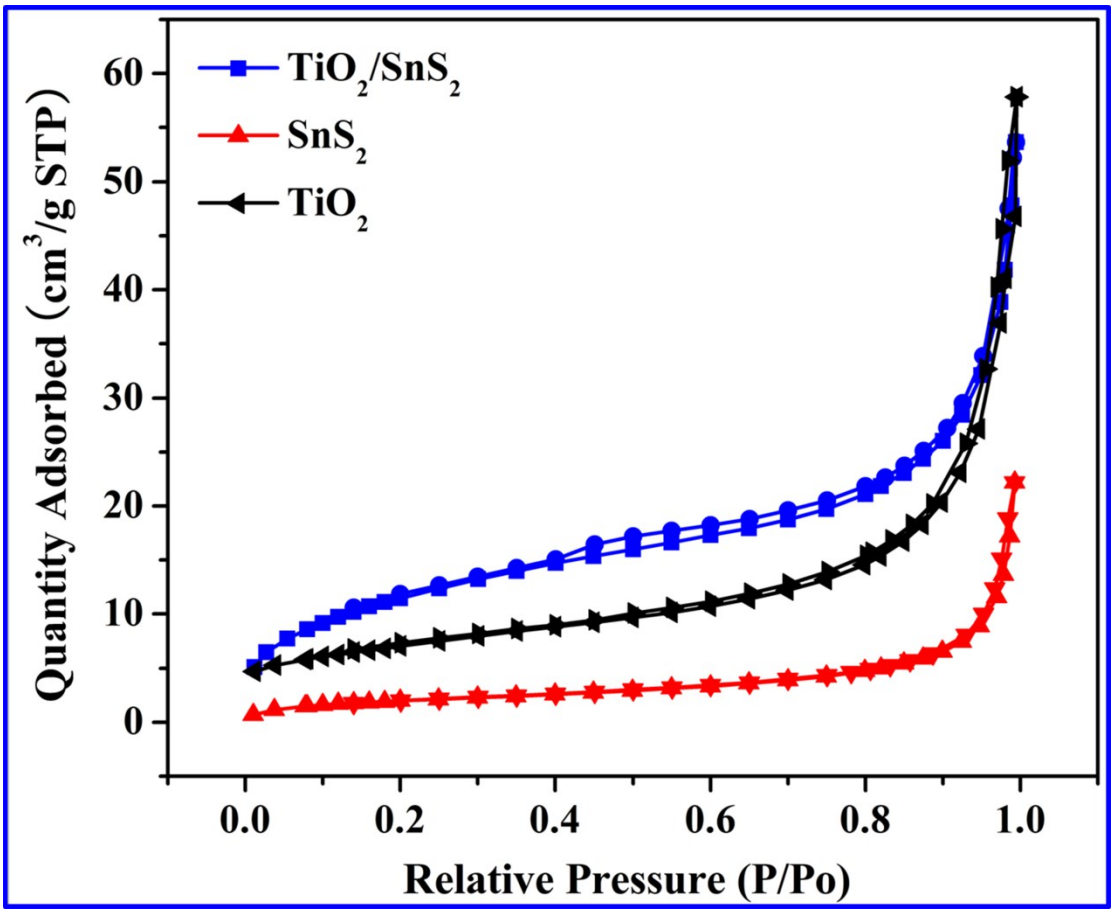


Figure S6. N_2 adsorption (left) and desorption (right) scanning isotherms of TiO_2 (black), SnS_2 (red), and TiO_2/SnS_2 (blue).

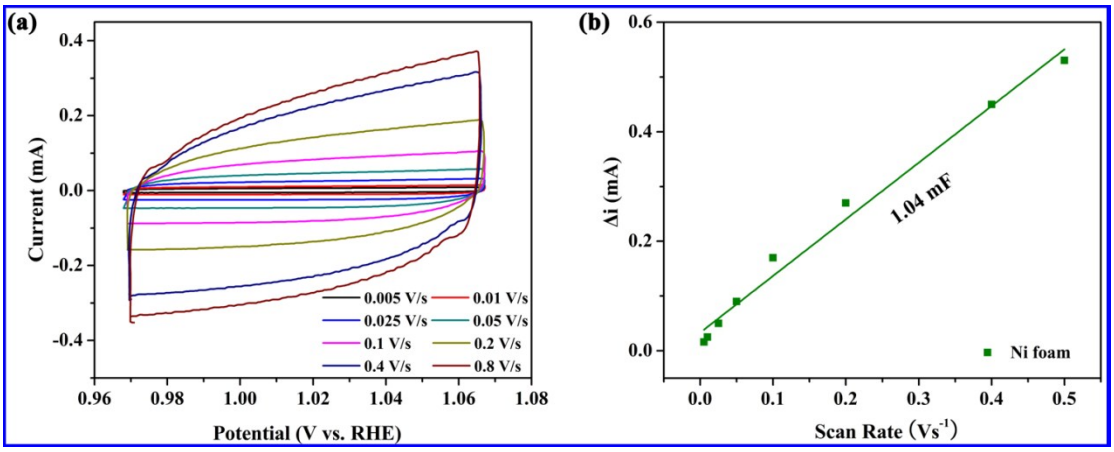


Figure S7. Cyclic voltammetry curves at scan rates of 0.005, 0.01, 0.025, 0.05, 0.1, 0.2, 0.4, 0.5V s-1 of Ni foam; (d) current differences as a function of the scan rate for Ni foam.

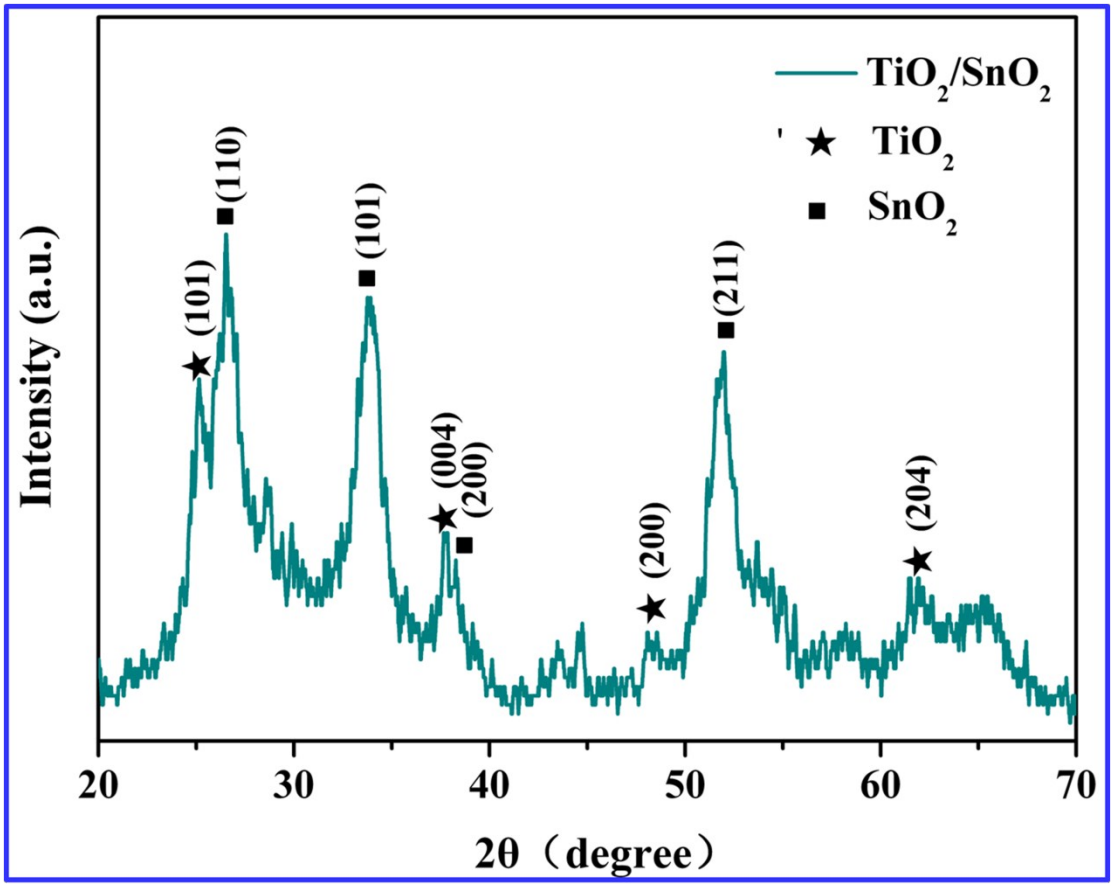


Figure S8. XRD image of TiO_2/SnO_2.

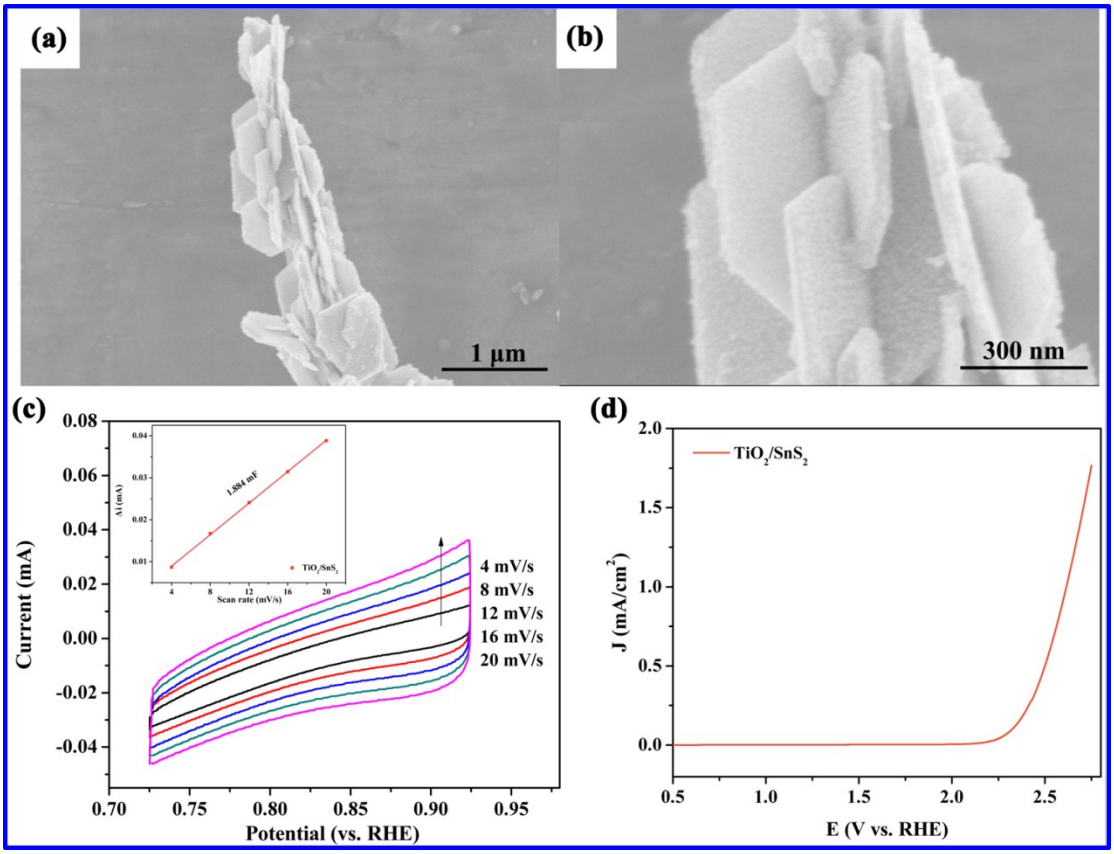


Figure S9. SEM images of TiO_2/SnO_2 in low and high magnification (a and b); Cyclic voltammetry curves at scan rates of 4, 8, 12, 16, 20 mV s^{-1} of TiO_2/SnO_2 (c); Insert (c) is the current differences as a function of the scan rate for TiO_2/SnO_2; Linear sweep voltammetry (LSV) curves of TiO_2/SnO_2 without further corrected in 1M NaOH, measured with a scan rate of 5 mV/s (d).

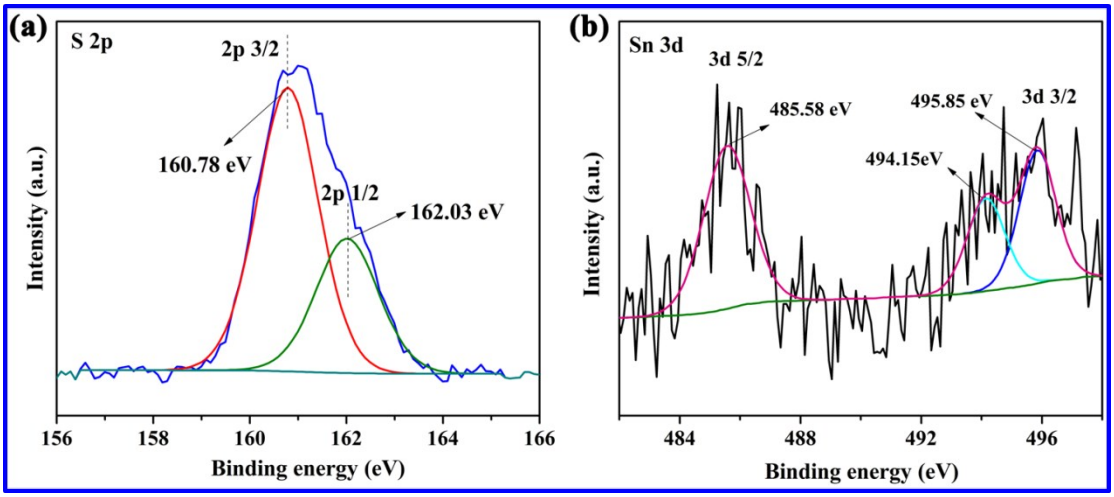


Figure S10. High resolution XPS spectrum of S 2p (a) and Sn 3d (b) after electrochemical test in 1 M NaOH.

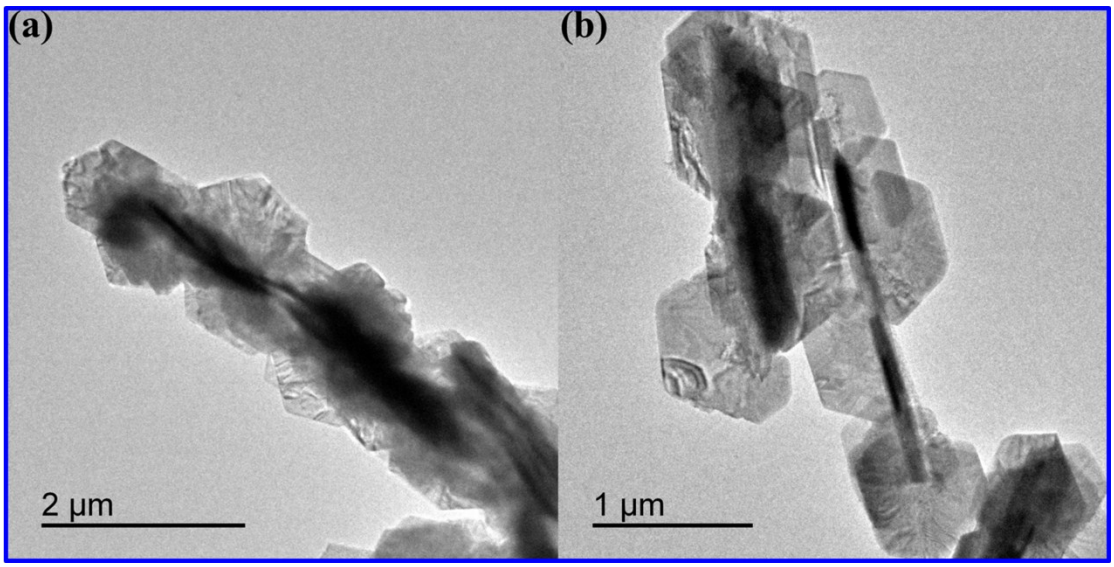


Figure S11. TEM images of TiO_2/SnS_2 after the electrochemical test.

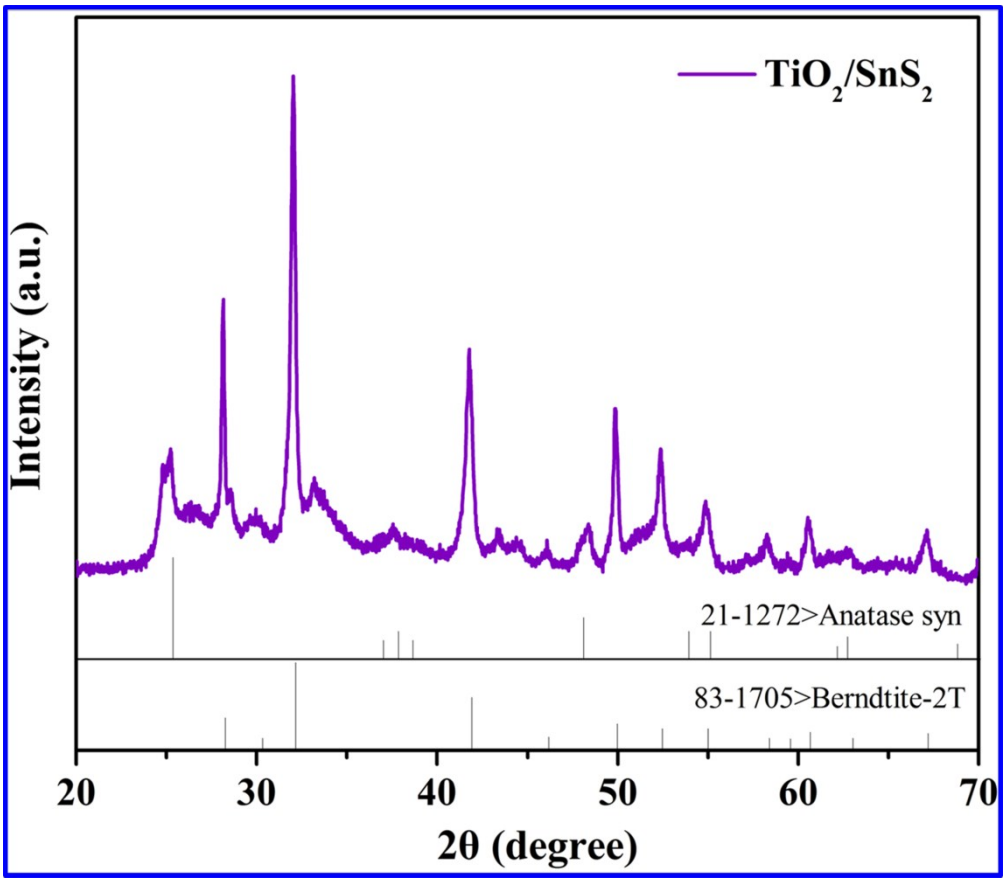


Figure S12. XRD image of TiO_2/SnS_2 after the electrochemical test.

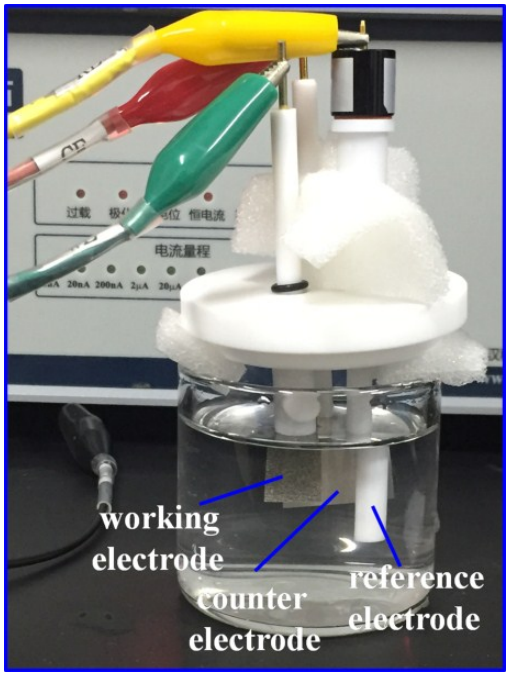
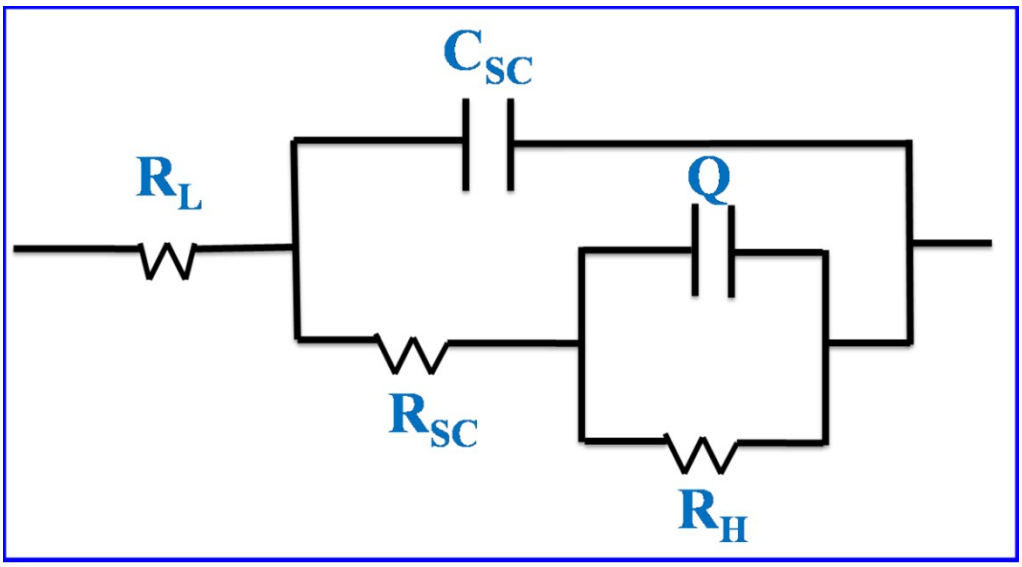


Figure S13. The installation drawing of three-electrode system of our testing system with working electrode, reference electrode (Hg/HgO) and counter electrode (Pt sheet).



Scheme 1 Equivalent circuit utilized to model electrochemical impedance spectra for oxygen evolution reaction in 1 M NaOH.