

*Supporting Information*

**Green Fabrication of Nanoporous BiVO<sub>4</sub> Films on ITO Substrates  
for Photoelectrochemical Water-oxidation**

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## Results



Figure S1 Conventional fabrication methods of  $\text{BiVO}_4$  photoanodes.

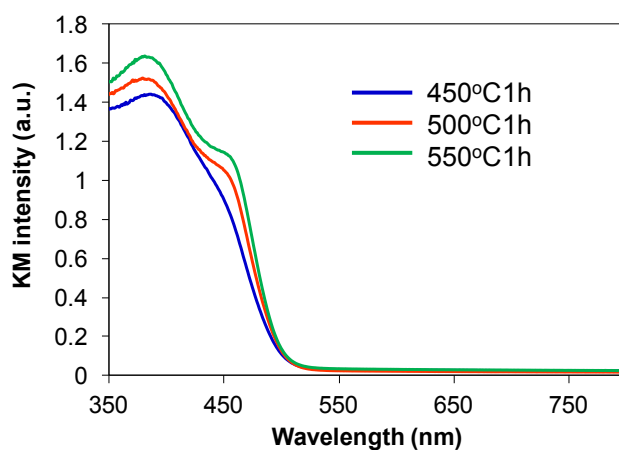


Figure S2. Diffuse reflectance spectra of  $\text{BiVO}_4$  electrodes prepared by coating an aqueous precursor solution (pH 9) followed by dryness and calcination at 450, 500, and 550°C for 1h.

Table S1. Stretching Raman shift of V-O bond and bond length of V-O on BiVO<sub>4</sub> electrodes prepared under different conditions.

Preparation conditions		Stretching Raman shift V-O bond (cm <sup>-1</sup> )	V-O bond length (Å)
pH of precursor solution	Calcinations		
4	500°C1h	826	1.696
5	500°C1h	826	1.696
6	500°C1h	826	1.696
7	500°C1h	826	1.696
8	500°C1h	826	1.696
9	450°C1h	826	1.696
9	450°C2h	826	1.696
9	500°C1h	825	1.697
9	500°C2h	827	1.695
9	500°C3h	826	1.696
9	550°C1h	827	1.695
9	550°C2h	827	1.695

\*calculated using the empirical equation:  $\nu(\text{cm}^{-1}) = 21349 \exp[-1.9176 R(\text{Å})]^{R1}$

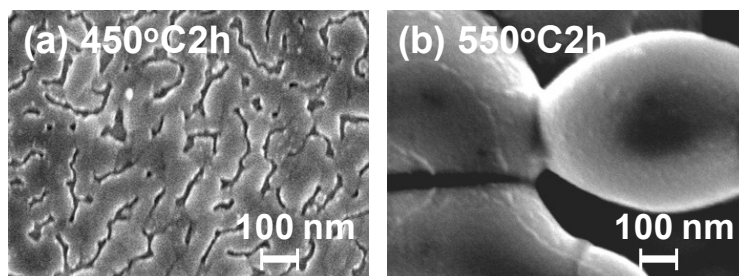


Figure S3. Surface SEM images of BiVO<sub>4</sub> electrodes (4 coat) prepared under different calcination conditions ((a)450°C for 2h, (b) 550°C for 2h).

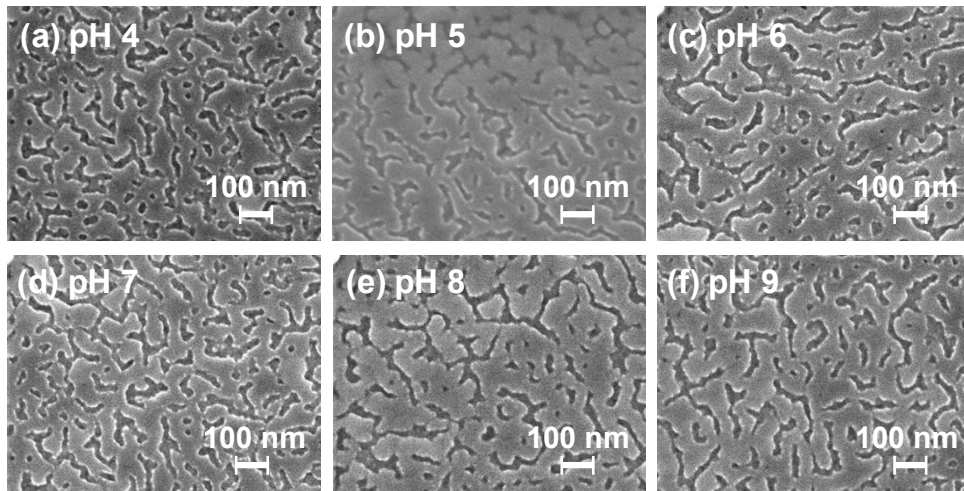


Figure S4. Surface SEM images of BiVO<sub>4</sub> electrodes (4 coat) prepared by using aqueous solution in a range of pH 4 to 9. All films were calcined at 500°C for 1h.

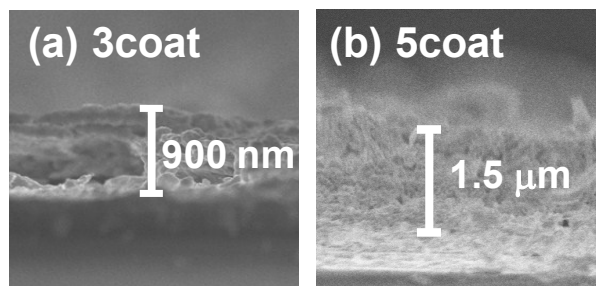


Figure S5. Cross-sectional SEM images of BiVO<sub>4</sub> electrodes with different coating times ((a) 3 coat, (b) 5 coat)). All films were calcined at 500°C for 1h.

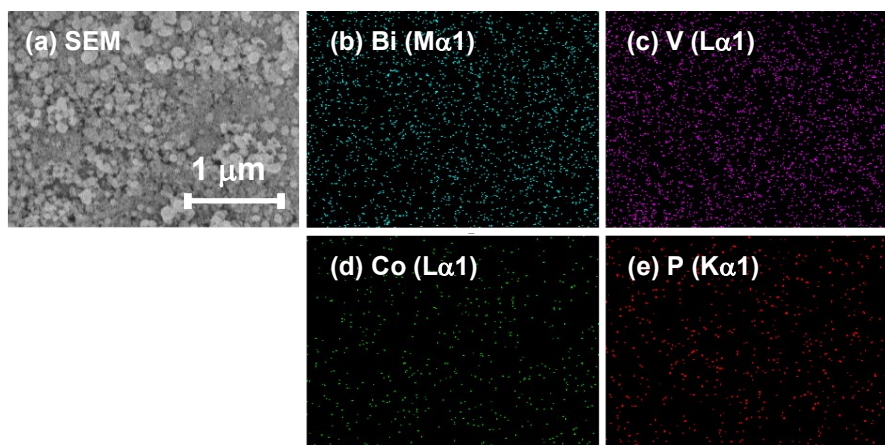


Figure S6. The top view SEM (a) and elemental mapping (b-e) images of the surface of CoPi-loaded BiVO<sub>4</sub> photoanode (4 coat-500C1h).

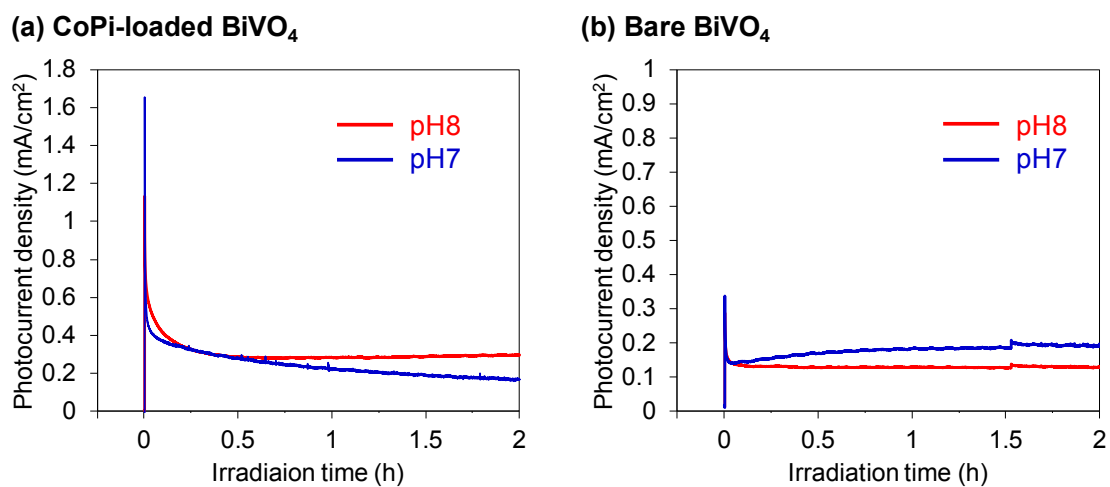


Figure S7. The amperometric  $I-t$  curves of (a) Co-Pi loaded BiVO<sub>4</sub> photoanode (4 coat-500C1h) and (b) BiVO<sub>4</sub> photoanode (4 coat-500C1h) under continuous illumination at 0.8 V vs. RHE.

**References:**

R1) S. Tokunaga, H. Kato and A. Kudo, *Chem. Mater.*, 2001, **13**, 4624–4628.