

## Electronic Supplementary Information

### **In<sup>3+</sup>-doped BiVO<sub>4</sub> Photoanode with Passivated Surface States for Photoelectrochemical Water Oxidation**

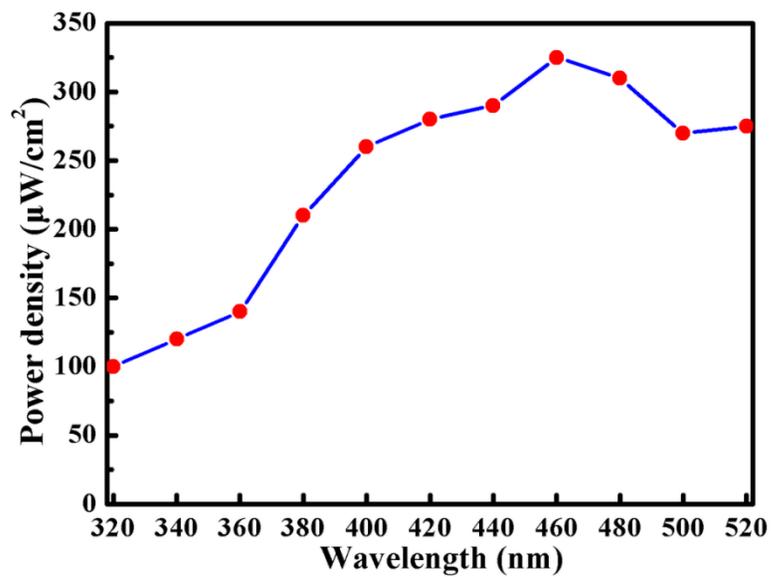
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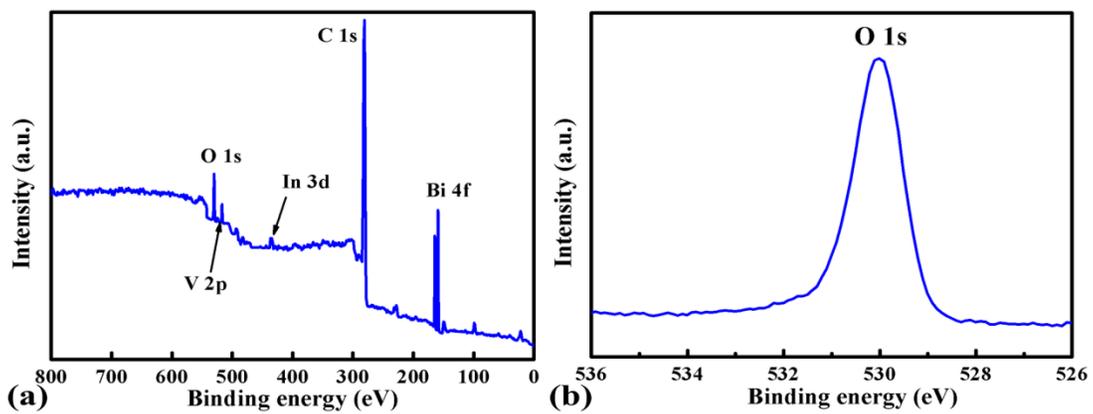
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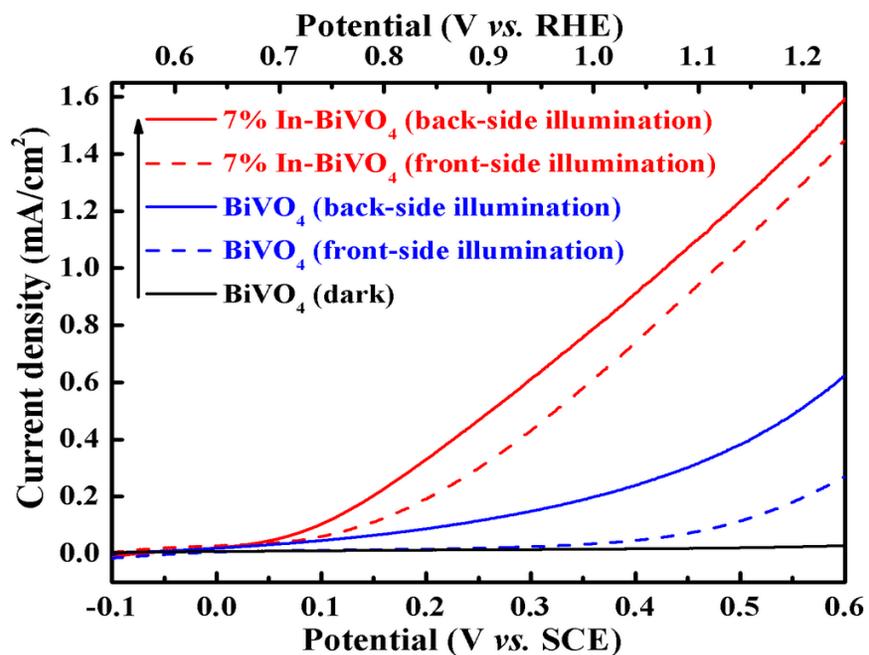
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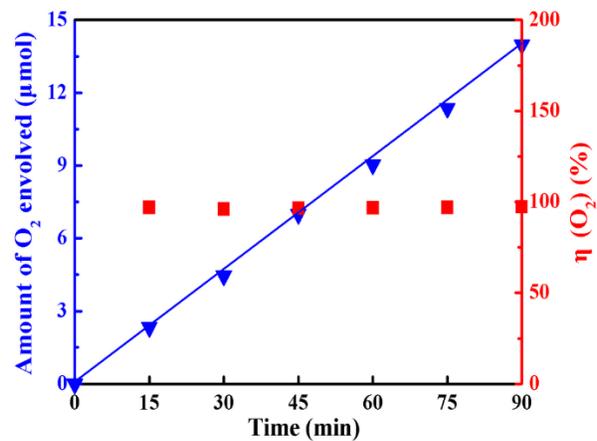
**Fig. S1** A typical incident light power density spectrum (from 320-520 nm) used for the IPCE measurement.



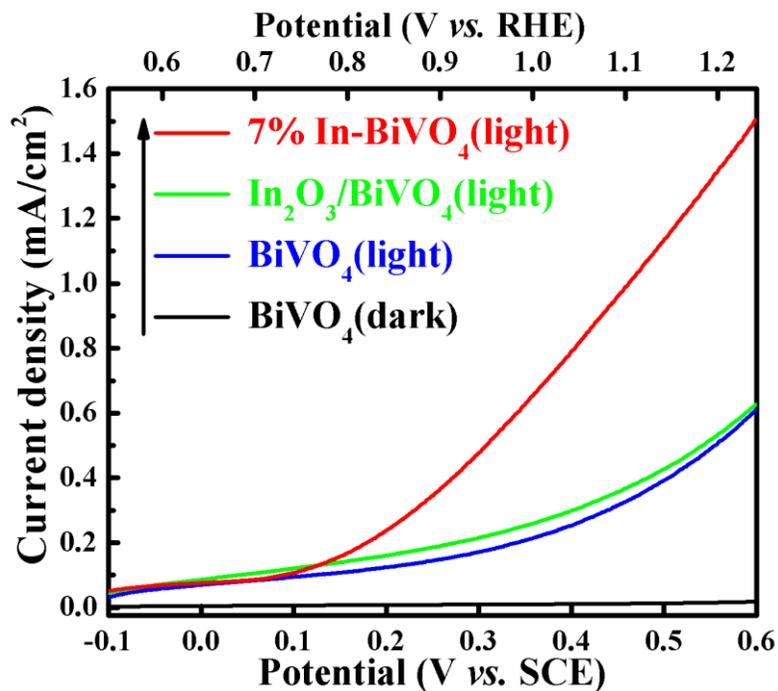
**Fig. S2** (a) Overall survey XPS spectrum of 7%  $\text{In}^{3+}$ -doped  $\text{BiVO}_4$  film; (b) O 1s high resolution XPS spectrum.



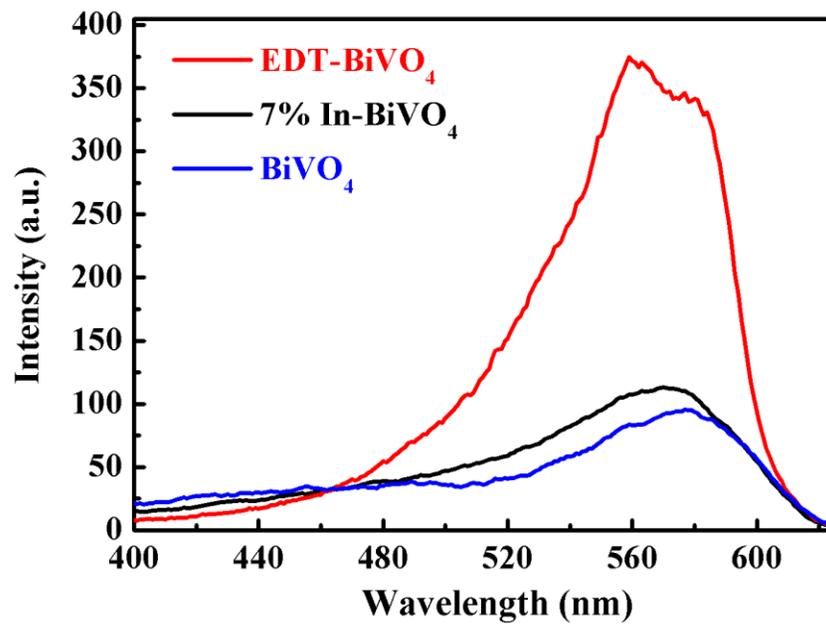
**Fig. S3** LSV scans for the undoped and 7% In<sup>3+</sup>-doped BiVO<sub>4</sub> film in 0.1 M Na<sub>2</sub>SO<sub>4</sub> (pH 6.8) under front-side (dashed line) and back-side illumination (solid line). The LSV measurements were conducted at a scan rate of 15 mV/s under 100 mW/cm<sup>2</sup> simulated solar light illumination.



**Fig. S4** Time course of O<sub>2</sub> generated (blue) and Faraday efficiency [ $\eta(\text{O}_2)$ ] (red) of 7% In-BiVO<sub>4</sub> film electrode. The measurement was conducted in 0.1 M Na<sub>2</sub>SO<sub>4</sub> solution (pH 6.8) at 1.0 V *vs.* RHE under 100 mW/cm<sup>2</sup> (AM 1.5 G) illumination.



**Fig. S5** LSV scans for undoped BiVO<sub>4</sub>, In<sub>2</sub>O<sub>3</sub>/BiVO<sub>4</sub> and 7% In<sup>3+</sup>-doped BiVO<sub>4</sub> film. The measurements were conducted in 0.1 M Na<sub>2</sub>SO<sub>4</sub> (pH 6.8) with a scan rate of 15 mV/s under 100 mW/cm<sup>2</sup> simulated solar light illumination.



**Fig. S6** PL spectra of undoped, 7% In<sup>3+</sup>-doped and EDT-treated BiVO<sub>4</sub> film measured in air.

**Table S1** The atomic ratio of V: Bi: In in the as-prepared film measured by ICP tests.

Sample	[V] ( $\mu\text{M}$ )	[Bi] ( $\mu\text{M}$ )	[In] ( $\mu\text{M}$ )	Atomic ratio (%) V : Bi : In
BiVO <sub>4</sub>	289.553	291.138	0	100 : 100 : 0
3% In-BiVO <sub>4</sub>	289.816	282.822	8.094	100 : 97.3 : 2.7
5% In-BiVO <sub>4</sub>	289.751	275.163	14.487	100 : 95.0 : 5.0
7% In-BiVO <sub>4</sub>	289.644	269.834	20.011	100 : 93.1 : 6.9
9% In-BiVO <sub>4</sub>	289.398	263.632	25.821	100 : 91.1 : 8.9

**Table S2** The integral photocurrent values for undoped BiVO<sub>4</sub> and 7% In<sup>3+</sup>-doped BiVO<sub>4</sub> film using IPCE data (shown in **Fig. 3d**) that measured in 0.1 M Na<sub>2</sub>SO<sub>4</sub> (pH 6.8) at a constant applied potential of 1.23 V vs. RHE.

Sample	Integral value (mA/cm <sup>2</sup> )	LSV measured value(mA/cm <sup>2</sup> )
BiVO <sub>4</sub> film	0.67	0.62
7% In-BiVO <sub>4</sub> film	1.41	1.56