Supporting Information for

Ultrathin BiVO₄ Nanobelts: Controllable Synthesis and Improved Photocatalytic Oxidation of Water

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Experimental Section

Chemical Reagents and Instruments: Ammonium metavanadate (NH$_4$VO$_3$), bismuth nitrate (Bi(NO$_3$)), ammonia (NH$_3$·H$_2$O), nitric acid (HNO$_3$), methanol (CH$_3$OH), silver nitrate (AgNO$_3$) were purchased from Sinopharm Chemical Regent Co., Ltd. Deionized water (18 MΩ, Molecular) was used for all solution preparations.

The morphology and size of the as-prepared products were characterized by using a field-emission scanning electron microscope (JSM-6701F, JEOL). The X-ray diffraction spectra (XRD) measurements were performed on a PANalytical X’Pert PRO instrument using Cu Kα radiation (40 kV). The XRD patterns were recorded from 10° to 90° with a scanning rate of 0.067 °/s. UV-visible diffuse reflectance spectra were taken on a UV-2550 (Shimadzu) spectrometer by using BaSO$_4$ as the reference. HRTEM imaging was carried out using an FEI Tecnai TF20 microscope operated at 200 kV.

Preparation of BiVO$_4$ nanobelts: Firstly, 0.036 g NH$_4$VO$_3$ was dissolved in 1 M ammonia solution (solution A) because it is slight soluble in pure water. 0.03 g BiNO$_3$ was dissolved into 1 M dilute nitric acid (solution B) since it could hydrolyze to BiONO$_3$ precipitates in aqueous solution. Secondly, solution A was added into solution B drop by drop. Along with the consumption of ammonia and nitric acid, NH$_4$VO$_3$ and BiNO$_3$ would react and produce tetragonal BiVO$_4$ nanoparticles. The PH is measured to be 5.1 after the full mixture of solution A with solution B. At last, the solution was transferred into a Teflon-lined stainless steel autoclave, which was kept at 180 °C for one day. After the hydrothermal reaction, the BiVO$_4$ nanobelts were obtained finally.

Preparation of BiVO$_4$ nanoparticles: The pure BiVO$_4$ nanoparticles was synthesized via a typical procedure, 1 mmol of Bi(NO$_3$)$_3$·5H$_2$O and 1mmol of NH$_4$VO$_3$ was added to 30 mL of 2 M nitric acid solution at room temperature and remained continuous stirring for 30 minutes. Then, an appropriate amount of NH$_3$OH (25~28%) was also added into the prepared solution to fit the pH value to 8. After stirring for 30 min, a clear orange solution was obtained. This solution was poured into a 50 mL Teflon-lined autoclave and maintained at 180°C for 24 h under autogenous pressure, and then naturally cooled to room temperature. The resulting precipitates were collected and washed with ethanol and deionized water thoroughly and dried at 80°C in air.

Photoelectrochemical measurements: The BiVO$_4$ nanobelts suspended in water and the
mixtures were ultrasonically scattered for 15 min to form homogeneous solution. Then, the solution was spin coated on a Fluorine-doped tin oxide (FTO) substrate with a rate of 300 rpm for 30 s. This procedure was repeated for 3 times. Photocatalytic reaction

**Photocatalytic reactions:** The photocatalytic O\(_2\) evolution was carried out with 0.3 g photocatalyst suspending in AgNO\(_3\) solution in a Pyrex glass reaction cell. The reaction cell was connected to a gas-closed system with a gas-circulated pump. A 300 W Xe arc lamp was employed for the light source of photocatalytic reaction. The evolved O\(_2\) was analyzed by an online gas chromatograph (GC-8A; Shimadzu Corp., Japan) equipped with a thermal conductivity detector.
Additional Figures

**Fig. S1.** SEM images of BiVO$_4$ nanoparticles before hydrothermal reaction.
Fig. S2. Sideview TEM image of BiVO$_4$ nanobelts.
Fig. S3. SEM image of BiVO$_4$ nanoparticles.
Fig. S4. SEM images of ultrathin BiVO$_4$ nanobelts after photocatalytic oxidation of water.