## **Supplementary Information**

## Synthesis and characterization of single-crystalline Bi<sub>2</sub>O<sub>2</sub>SiO<sub>3</sub> nanosheets with exposed {001} facets

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Fig. S1. XRD patterns of BOS samples at different pH: (a) pH=2, (b) pH=5, (c) pH=8, (d) pH=10, (e) pH=12.



Fig. S2. XRD patterns of BOS samples at different content of CTAB: (a) 0 mmol CTAB, (b) 1mmol CTAB, (c) 2mmol CTAB, (d) 4mmol CTAB. (pH=12)

Table. S1 The approximate calculation of the (001) facets ratio of  $Bi_2O_2SiO_3$  nanosheets. ( <sup>a</sup>Width of the  $Bi_2O_2SiO_3$  nanosheets (nm), <sup>b</sup>Approximate thickness (nm) from SEM images.)

			× 7	
Sample	morphology	Average Wa (nm)	Average Hb (nm)	{001} facets ratio
BOS-0	sheets	900	60	52.9%
BOS-1	sheets	600	55	68.9%
BOS-2	sheets	290	40	79.0%
BOS-4	sheets	160	28	92.0%



Fig. S3. EDS of the BOS samples.



Fig. S4. Plots of the square or square root of the absorption coefficient vs. energy.



Fig. S5. Structural representation of orthorhombic  $Bi_2O_2SiO_3$ .



Fig. S6. XRD patterns of the BOS-4 before and after photocatalytic reaction.



Fig. S7. SEM image of BOS-4 after five batches of photodegradation.