**Supplementary information files**

Tunable Synthesis of ultrathin BiOCl 2D nanosheets for Efficient Photocatalytic Degradation of Carbamazepine upon Visible-Light Irradiation

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Fig. S1. The absorption spectra for the degradation of carbamazepine over ultrathin BiOCl.

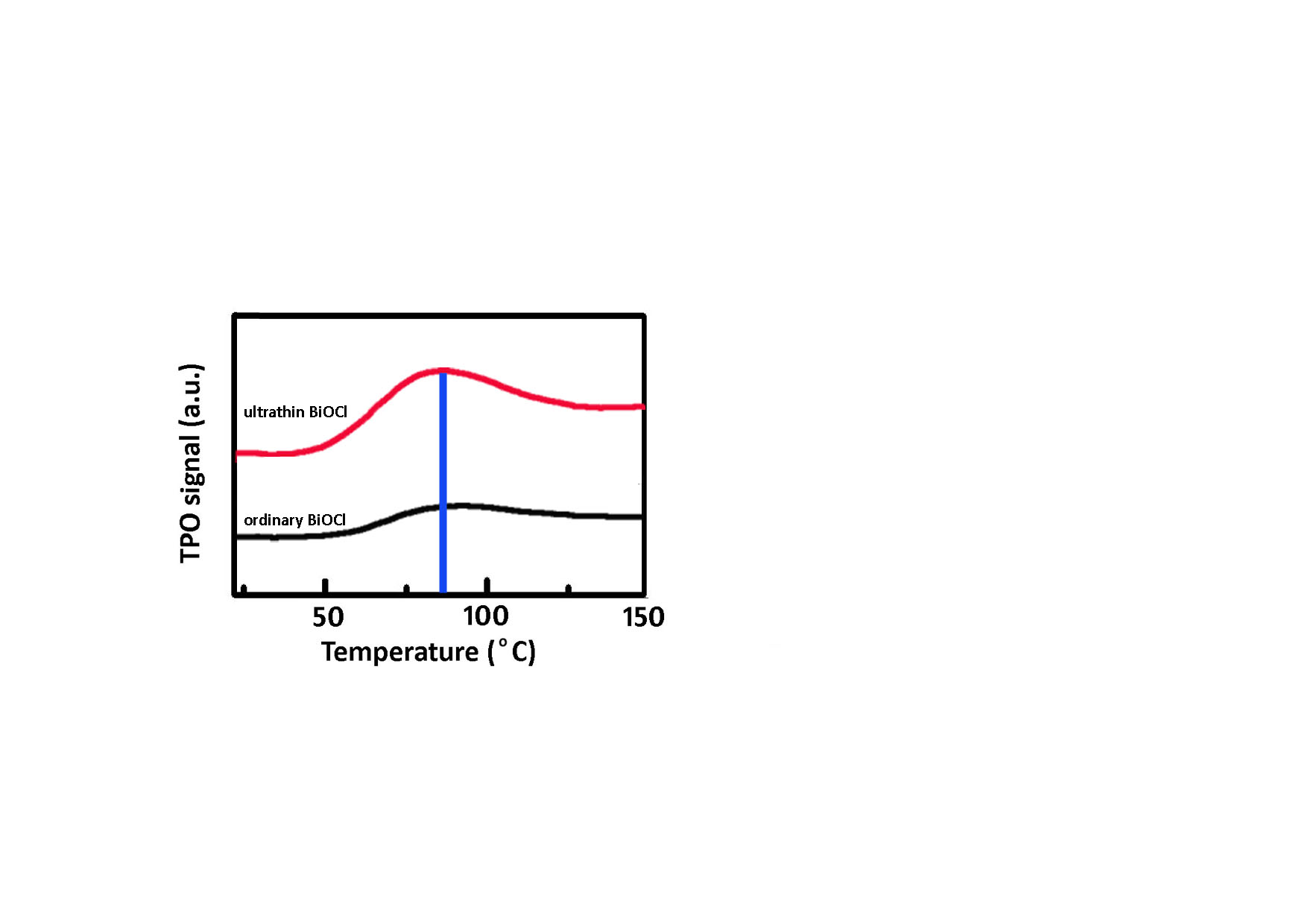


Fig. S2. TPO spectra of the as-synthesized BiOCl samples.



Fig. S3. XRD patterns of the as-synthesized BiOCl samples



**ultrathin BiOCl**

**ordinary BiOCl**

Fig. S4. TEM images of the as-synthesized BiOCl samples



Fig. S5. The average thickness of ultrathin BiOCl samples characterized by AFM



Fig. S6. UV–vis diffuse reflection spectra of the as-synthesized BiOCl samples.



Fig. S7. Photocatalytic degradation CBZ over the as-synthesized BiOCl samples.in the presence of various radicals scavengers.

White precipitate means the formation of BiOCl. In fact, BiOCl could be formed in acidic conditions, which was also found by An [1] and Sarwan [2,3]. Wang demonstrated that Bi3+ could be completely transformated to BiOCl when the catalyst preparation reaction solution pH >1.7. The reactions for the formation of BiOCl are as follows [4].:

Bi(NO3)3+ 3NaCI=BiCl3+ 3NaNO3 (1 )

Bi3+ + Cl-+ 2H2O =Bi(OH)2Cl + 2H+ (2)

Bi(OH)2Cl=**BiOCl**+H2O (3)

Furthermore, Complete degradation of Carbamazepine was confirmed by TOC measurements. The TOC of the photocatalytic degradation was 10.5%, which was much higher than some other reported photocatalyst, such as BiPO4 (5%) [5].and thermally activated persulfate (TAP) oxidation (5.7%)[6].

The effect of pH was tested in the degradation process (Carbamazepine solution pH was varied from 3, 5, 7 and 9). However, the carbamazepine solution pH of 1 was not tested for that BiOCl particles were hard to be removed from the reaction solution and interfered the measurement of CBZ.

As shown in Fig. S8, the initial pH had a significant impact on the photoefficiency of CBZ, and acidic condition was more favorable than neutral and alkaline conditions. These results were consistent with previous reports showing that low pH favored the photodegradation of CBZ [7].



Fig. S8. Effect of initial pH on CBZ degradation

If we add more NaOH pH 8, massive bubbles were formed in the preparation process of BiOCl. And the photocatalytic activity of formed BiOCl was tested. As shown in Fig. S9, the BiOCl (formed in the catalyst preparation reaction solution pH of 8) displayed a similar photocatalytic activity as that prepared in the pH of 2. To save reagents, the pH was adjusted to 2 by NaOH.

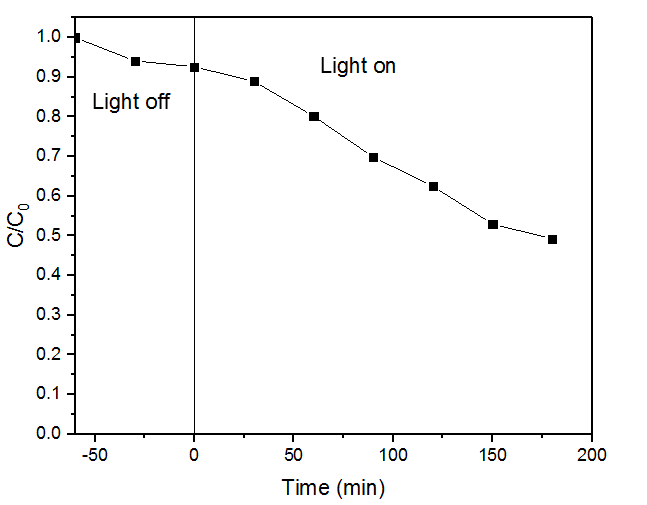


Fig. S9. Photocatalytic degradation CBZ over the BiOCl formed in the catalyst preparation reaction solution pH of 8.

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