

**Sacrificial template synthesis of 3D flower-like Sn-doped BiOCl
hierarchical structure with enhanced performance for
degradation of tetracycline hydrochloride**

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** Corresponding author. E-mail: wulp@gdlhz.ac.cn

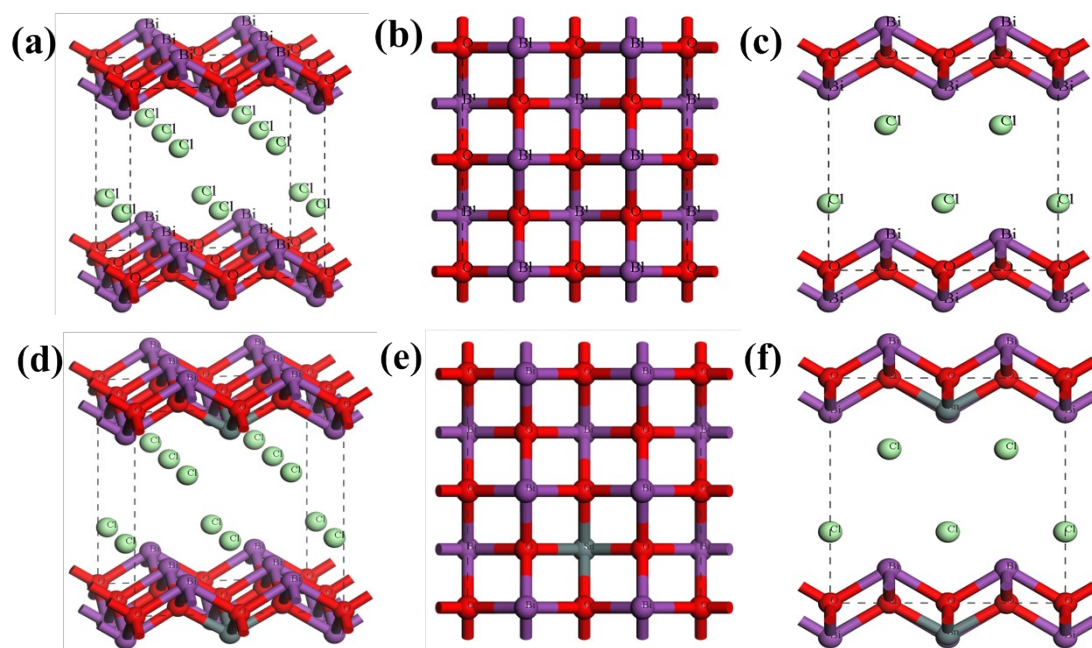


Fig. S1 The optimized schematic representation of the crystal structures of pure BiOCl (a: front view, b: top view, c: side view), and Sn-doped BiOCl (d: front view, e: top view, f: side view).

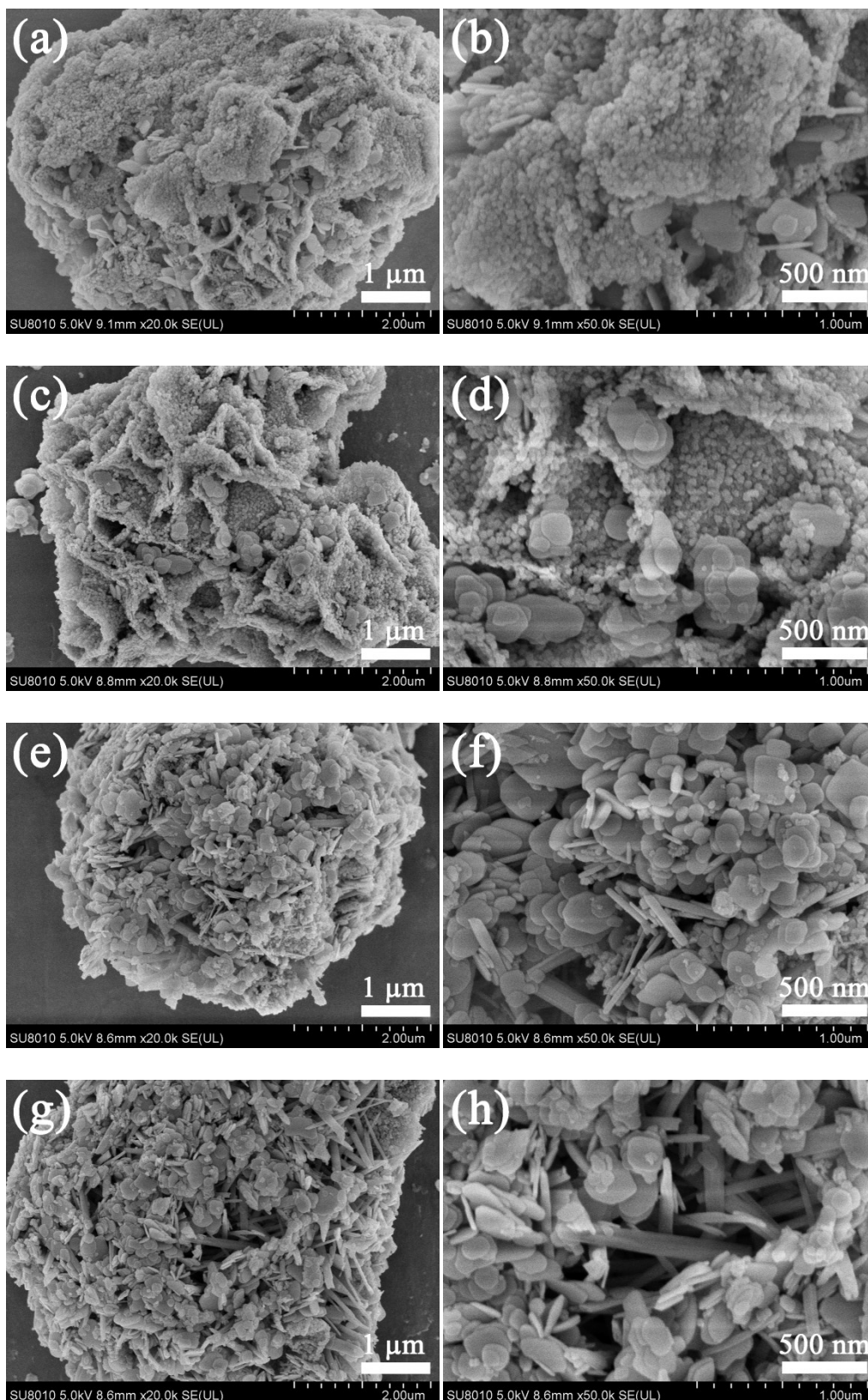


Fig. S2 SEM images of the Sn-BiOCl-1 (a and b), Sn-BiOCl-2 (c and d), Sn-BiOCl-4 (e and f) and Sn-BiOCl-5 (g and h).



Fig. S3 The digital photographs of pure BiOCl (a), Sn-BiOCl-1 (b), Sn-BiOCl-2 (c), Sn-BiOCl-3 (d), Sn-BiOCl-4 (e), Sn-BiOCl-5 (f) and SnS₂ (g).

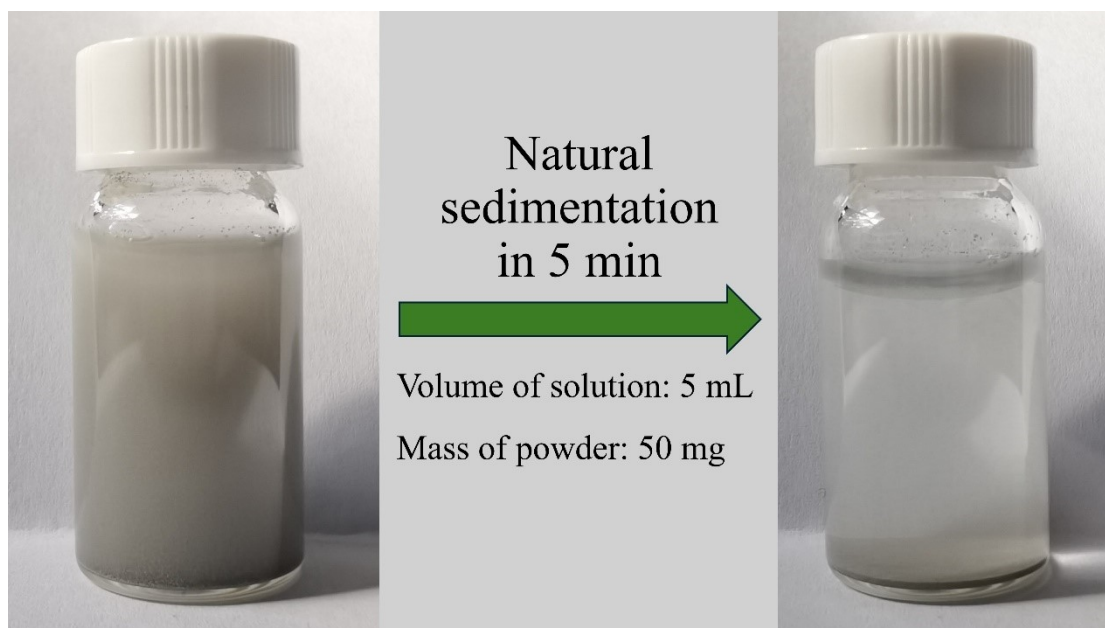


Fig. S4 The digital photographs for the natural sedimentation of Sn-BiOCl-3 powder in TCH solution.

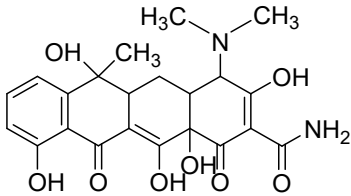
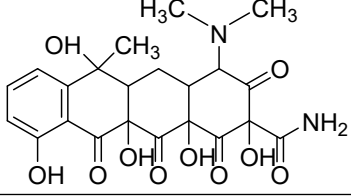
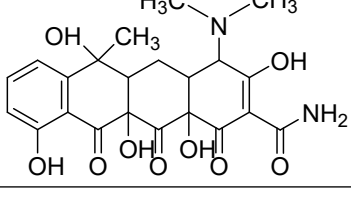
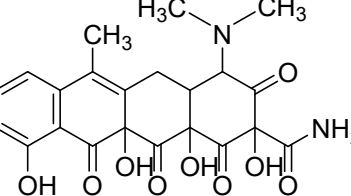
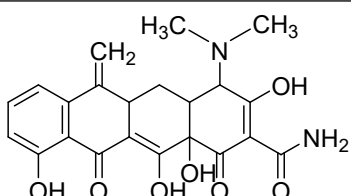
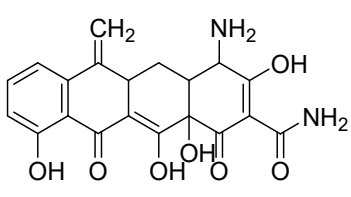
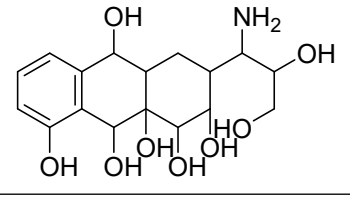
Table S1 The LC-MS spectra and corresponding m/z values of TCH and its intermediate products during the photocatalytic oxidation process.

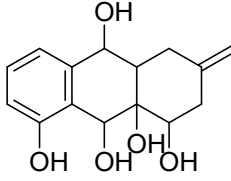
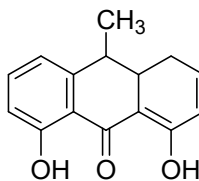
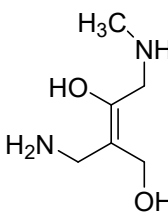
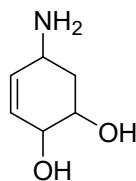
Name	Mass-to-charge ratio (m/z)	LC-MS spectra
TCH	445	<p>SAMPLE #2812 RT: 9.96 AV: 1 NL: 2.32E7 T: FTMS + p ESI Full ms [50.0000-750.0000]</p>
A	477	<p>SAMPLE #367 RT: 1.26 AV: 1 NL: 2.97E7 T: FTMS + p ESI Full ms [50.0000-750.0000]</p>
B	461	<p>SAMPLE #2020 RT: 7.07 AV: 1 NL: 1.96E7 T: FTMS + p ESI Full ms [50.0000-750.0000]</p>
C	459	<p>SAMPLE #2913 RT: 10.34 AV: 1 NL: 1.75E7 T: FTMS + p ESI Full ms [50.0000-750.0000]</p>

D	427	<p>SAMPLE #3748 RT: 13.25 AV: 1 NL: 2.21E7 T: FTMS + p ESI Full ms [50.0000-750.0000]</p>
E	399	<p>SAMPLE #3981 RT: 14.02 AV: 1 NL: 2.89E7 T: FTMS + p ESI Full ms [50.0000-750.0000]</p>
F	371	<p>SAMPLE #5404 RT: 18.38 AV: 1 NL: 3.82E7 T: FTMS + p ESI Full ms [50.0000-750.0000]</p>
G	279	<p>SAMPLE #1851 RT: 6.45 AV: 1 NL: 1.81E7 T: FTMS + p ESI Full ms [50.0000-750.0000]</p>

<p>H</p>	<p>242</p>	<p>SAMPLE #3162 RT: 11.25 AV: 1 NL: 7.21E7 T: FTMS + p ESI Full ms [50.0000-750.0000]</p> <p>Relative Abundance vs m/z</p> <table border="1"> <thead> <tr> <th>m/z</th> <th>Relative Abundance</th> </tr> </thead> <tbody> <tr><td>56.05</td><td>~25</td></tr> <tr><td>50.04</td><td>~25</td></tr> <tr><td>61.04</td><td>~20</td></tr> <tr><td>74.06</td><td>~15</td></tr> <tr><td>116.99</td><td>~15</td></tr> <tr><td>148.01</td><td>~15</td></tr> <tr><td>191.02</td><td>~35</td></tr> <tr><td>198.13</td><td>~70</td></tr> <tr><td>214.09</td><td>~15</td></tr> <tr><td>242.15</td><td>100</td></tr> <tr><td>250.11</td><td>~25</td></tr> <tr><td>279.16</td><td>~5</td></tr> <tr><td>308.94</td><td>~5</td></tr> <tr><td>417.16</td><td>~5</td></tr> <tr><td>445.16</td><td>~5</td></tr> <tr><td>499.83</td><td>~5</td></tr> <tr><td>577.58</td><td>~5</td></tr> <tr><td>618.43</td><td>~5</td></tr> <tr><td>653.56</td><td>~5</td></tr> </tbody> </table>	m/z	Relative Abundance	56.05	~25	50.04	~25	61.04	~20	74.06	~15	116.99	~15	148.01	~15	191.02	~35	198.13	~70	214.09	~15	242.15	100	250.11	~25	279.16	~5	308.94	~5	417.16	~5	445.16	~5	499.83	~5	577.58	~5	618.43	~5	653.56	~5								
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<p>I</p>	<p>147</p>	<p>SAMPLE #5915 RT: 19.97 AV: 1 NL: 1.21E7 T: FTMS - p ESI Full ms [50.0000-750.0000]</p> <p>Relative Abundance vs m/z</p> <table border="1"> <thead> <tr> <th>m/z</th> <th>Relative Abundance</th> </tr> </thead> <tbody> <tr><td>61.99</td><td>~55</td></tr> <tr><td>91.00</td><td>~15</td></tr> <tr><td>100.93</td><td>~25</td></tr> <tr><td>115.92</td><td>~45</td></tr> <tr><td>130.94</td><td>~55</td></tr> <tr><td>146.97</td><td>~20</td></tr> <tr><td>174.96</td><td>100</td></tr> <tr><td>191.95</td><td>~15</td></tr> <tr><td>215.92</td><td>~10</td></tr> <tr><td>242.94</td><td>~35</td></tr> <tr><td>248.96</td><td>~10</td></tr> <tr><td>300.90</td><td>~5</td></tr> <tr><td>304.91</td><td>~20</td></tr> <tr><td>316.95</td><td>~5</td></tr> <tr><td>378.92</td><td>~15</td></tr> <tr><td>395.91</td><td>~5</td></tr> <tr><td>440.89</td><td>~10</td></tr> <tr><td>446.91</td><td>~10</td></tr> <tr><td>463.90</td><td>~5</td></tr> <tr><td>508.88</td><td>~5</td></tr> <tr><td>576.86</td><td>~5</td></tr> <tr><td>638.83</td><td>~5</td></tr> <tr><td>706.82</td><td>~5</td></tr> </tbody> </table>	m/z	Relative Abundance	61.99	~55	91.00	~15	100.93	~25	115.92	~45	130.94	~55	146.97	~20	174.96	100	191.95	~15	215.92	~10	242.94	~35	248.96	~10	300.90	~5	304.91	~20	316.95	~5	378.92	~15	395.91	~5	440.89	~10	446.91	~10	463.90	~5	508.88	~5	576.86	~5	638.83	~5	706.82	~5
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Table S2 The molecular formulas and structural formulas of TCH and its intermediates products during the photocatalytic oxidation process.

Name	Molecular formula	Mass-to-charge ratio (m/z)	Structural formula
TCH	$C_{22}H_{24}O_8N_2$	445	
A	$C_{22}H_{24}O_{10}N_2$	477	
B	$C_{22}H_{24}O_9N_2$	461	
C	$C_{22}H_{22}O_9N_2$	459	
D	$C_{22}H_{22}O_7N_2$	427	
E	$C_{20}H_{19}O_7N_2$	399	
F	$C_{17}H_{25}O_8N$	371	

G	$C_{15}H_{18}O_5$	279	 <p>The structure shows a complex polycyclic system. It features a benzene ring fused to a six-membered ring, which is further fused to another six-membered ring containing a vinyl group. There are four hydroxyl groups attached to the structure.</p>
H	$C_{15}H_{14}O_3$	242	 <p>The structure consists of three fused six-membered rings. It has a methyl group (CH₃) at the top, a carbonyl group (C=O) in the middle, and two hydroxyl groups (OH) at the bottom.</p>
I	$C_6H_{14}O_2N_2$	147	 <p>The structure is a branched molecule with a central carbon-carbon double bond. One carbon of the double bond is bonded to a hydroxyl group (HO) and a methylamino group (H₃C-NH). The other carbon is bonded to an amino group (H₂N) and a hydroxymethyl group (-CH₂-OH).</p>
J	$C_6H_{11}O_2N$	130	 <p>The structure is a six-membered ring with a double bond. It has an amino group (NH₂) at the top, and two hydroxyl groups (OH) at the bottom.</p>