Hierarchical flake-like Bi$_2$MoO$_6$/TiO$_2$ bilayer films for visible-light-induced self-cleaning applications

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**Fig. S1** 3D AFM images of Bi$_2$MoO$_6$/TiO$_2$ bilayer films obtained from different reaction time: (A) 1 h, (B) 3 h, (C) 6 h and (D) 10 h.

**Fig. S2** N$_2$ adsorption-desorption isotherms of Bi$_2$MoO$_6$/TiO$_2$ bilayer films obtained from different reaction time: (a) 1 h, (b) 3 h, (c) 6 h and (d) 10 h. The inset shows the corresponding pore size distributions.
**Table S1** Surface areas and pore sizes of the Bi$_2$MoO$_6$/TiO$_2$ bilayer films obtained from different reaction time.

<table>
<thead>
<tr>
<th>Samples obtained from different reaction time (h)</th>
<th>S$_{BET}$ (m$^2$/g)</th>
<th>Pore size (nm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>24.5</td>
<td>3.2</td>
</tr>
<tr>
<td>3</td>
<td>28.8</td>
<td>7.5</td>
</tr>
<tr>
<td>6</td>
<td>32.5</td>
<td>12.8</td>
</tr>
<tr>
<td>10</td>
<td>49.5</td>
<td>4.5, 15.2</td>
</tr>
</tbody>
</table>

**Fig. S3** Nyquist plots of the EIS data of the as-made thin films on FTO glass with a) TiO$_2$, b) Bi$_2$MoO$_6$, and Bi$_2$MoO$_6$/TiO$_2$ bilayer films obtained from different reaction time: (c) 1 h, (d) 3 h, (e) 6 h and (f) 10 h.
Fig. S4 The postulated mechanism for visible light photodegradation of alizarin red with Bi$_2$MoO$_6$/TiO$_2$ films.
**Fig. S5** A and C is Gas chromatogram of the main component of during and after visible light photocatalytic degradation of ARS dye from GC-MS spectroscopy, respectively. B and D is Mass spectra of the corresponding main component of during and after visible light photocatalytic degradation of ARS dye from GC-MS spectroscopy, respectively.