Graphene nanodots decorated ultrathin P doped ZnO nanosheets for highly efficient photocatalyst

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**Fig. S1** Thermogravimetric Analysis (Pyris 1, PerkinElmer) of ZnO:P/GNDs composites with different amounts of GNDs. Weight ratios of the five samples are about 0.4 wt.%, 1.0 wt.%, 1.6 wt.%, 2.1 wt.%, and 2.7 wt.%, respectively.
Fig. S2 (a) AFM height topography and (b) cross-sectional profiles of as-grown ZnO:P nanosheets. The mean thickness of ZnO:P nanosheets is about 20-30 nm.
Fig. S3 PL spectra of graphene nanodots. The emission peak is located at 526 nm.
**Fig. S4** XPS spectra of ZnO:P nanosheets, (a) the Zn 2p spectrum and (b) the P 2s spectrum.
Table S1 Apparent rate constants $k$ calculated according to the UV-VIS spectra for degrading RhB of ZnO:P/GNDs with different amounts of GNDs.

<table>
<thead>
<tr>
<th>GNDs ratio</th>
<th>0</th>
<th>0.4 wt.%</th>
<th>1.0 wt.%</th>
<th>1.6 wt.%</th>
<th>2.1 wt.%</th>
<th>2.7 wt.%</th>
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<tbody>
<tr>
<td>$k$ (min$^{-1}$)</td>
<td>0.131</td>
<td>0.210</td>
<td>0.254</td>
<td>0.442</td>
<td>0.287</td>
<td>0.266</td>
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