## **Electronic Supplementary Information for**

## High surface energy enables efficient and stable photocatalytic toluene degradation via the suppression of intermediate byproducts

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Fig. S1 TEM-EDX elemental mapping of Zn (a), Ga (b) and O (c) in ZnGa<sub>2</sub>O<sub>4</sub>.



Fig. S2 The enlarged version of HRTEM of  $ZnGa_2O_4$ -100.



Fig. S3 N<sub>2</sub> adsorption-desorption isotherms (a) and pore size distribution curves (b) of P25 and ZnGa<sub>2</sub>O<sub>4</sub>-100.



**Fig. S4** Spin-trapping ESR spectra under UV irradiation for 0, 5 and 15 min (corresponding red, green and blue line) using different trapping agents in the presence of P25.



Fig. S5 Photocatalytic stability of ZnGa<sub>2</sub>O<sub>4</sub>-100 for the oxidation removal of toluene in air.