Facile fabrication of direct solid-state Z-scheme g-C$_3$N$_4$/Fe$_2$O$_3$ heterojunction: A cost-effective photocatalyst with high efficiency for aqueous organic pollutant degradation

Junwei Wang$^1$, Xiaojun Zuo$^1$, Wei Cai$^1$, Jinwei Sun$^1$, Xinlei Ge$^{1,*}$, Hui Zhao$^{1,2,*}$

1. Collaborative Innovation Center of Atmospheric Environment and Equipment Technology, Jiangsu Key Laboratory of Atmospheric Environment Monitoring and Pollution Control, School of Environmental Science and Engineering, Nanjing University of Information Science & Technology (NUIST), 219 Ningliu Road, Nanjing 210044, China

2. Jiangsu Key Laboratory of Anaerobic Biotechnology, School of Environment and Civil Engineering, Jiangnan University, 1800 Lihu Avenue, Wuxi 214122, China

* Corresponding authors: Dr. Xinlei Ge: caxinra@163.com; Dr. Hui Zhao: zhaohui0919@163.com.
**Fig. S1.** SEM images of $\alpha$-Fe$_2$O$_3$ surface (a) and side (b).

**Fig. S2.** TEM images of $\alpha$-Fe$_2$O$_3$ surface (a) and side (b).

**Fig. S3.** Images of the generated g-C$_3$N$_4$/Fe$_2$O$_3$ composites in the crucibles (a) and typical g-C$_3$N$_4$/Fe$_2$O$_3$-2# agglomeration picked out from the crucible.
**Fig. S4** Visible-light-driven TC degradation of TC in presence of g-C₃N₄ and g-C₃N₄/Fe₂O₃-2#. Experimental conditions: reaction volume: 100 mL, TC concentration: 10 mg/L, catalyst concentration: 0.3 mg/mL.