Novel Ag3PO4/Nb2O5 fiber composite with enhanced photocatalytic performance and stability

Ruyi Shao¹, Xi Zeng², Zhenzhu Cao*¹, Hongjie Dong¹, Liying Wang¹, Fang Wang², Jinrong Liu¹, Zhi Li³, Qinghua Liang³

1. College of Chemical Engineering, Inner Mongolia University of Technology, Hohhot, 010051, China
2. State Key Laboratory of Multi-phase Complex System, Institute of Process Engineering, Chinese Academy of Sciences, Beijing, 100190, China
3. Key Laboratory of Photochemical Conversion and Optoelectronic Materials, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences, Beijing, 100190, China

*Corresponding author: czz03@163.com
Tel: +86 471 6575722;

Fig.S1 The TG and DSC curves of catalyst precursor a) TG curves of niobium oxalate and cotton fibers b) DSC curve of niobium oxalate

Fig.S2 (a and b) SEM images of biomorphic Nb2O5 fibers precursor pretreatment at 300°C (in air). (c and d) SEM images of sample pretreatment at 700°C (in N₂).
Fig. S3 $N_2$ adsorption-desorption isotherms and BJH measurement (inset) of synthesized biomorphic Nb$_2$O$_5$ hollow fibers sample 1: previously-prepared Nb$_2$O$_5$ fiber and sample 2: Nb$_2$O$_5$ fibers with coarse surface.

Fig. S4 SEM images of as-prepared Ag$_3$PO$_4$ particle.

Fig. S5. XPS spectra of the Nb$_2$O$_5$, Ag$_3$PO$_4$/Nb$_2$O$_5$, and Ag$_3$PO$_4$: (a) O 1s, (b) P 2p, (c) Ag 3d and (d) C 1s.
Fig. S6 Photocatalytic activity of different Ag₃PO₄/Nb₂O₅ molar ratio for RhB degradation under visible light irradiation;

Fig. S7 XRD patterns of used Ag₃PO₄ and used Ag₃PO₄/Nb₂O₅.

Fig. S8 Photoluminescence spectra of Nb₂O₅, Ag₃PO₄ and Ag₃PO₄/Nb₂O₅ photocatalysts.

Fig. S9 SEM results of Ag₃PO₄/Nb₂O₅ composite with Ag:Nb = 5:3