Electronic Supplementary Information

RGO/TiO$_2$ nanosheets immobilized on magnetically actuated artificial cilia film: A new mode for efficient photocatalytic reaction

Wei Wang$^{a,b,*}$, Xiaogu Huang$^{a,b}$, Min Lai$^a$, Chunhua Lu$^{b,c,*}$

$^a$School of Physics and Optoelectronic Engineering, Nanjing University of Information Science & Technology, Nanjing 210044, PR China

$^b$Jiangsu Collaborative Innovation Center for Advanced Inorganic Function Composites, Nanjing Tech University, Nanjing 210009, PR China

$^c$State Key Laboratory of Materials-Oriented Chemical Engineering, College of Materials Science and Engineering, Nanjing Tech University, Nanjing 210009, PR China
**Fig. S1** XRD pattern of as-prepared TiO$_2$ nanosheets.

**Fig. S2** Photograph of water droplets deposited on the PDMS film (a) before and (b) after AAPGD treatment.
**Fig. S3** Photocatalytic activity of pristine and APTMS modified TiO$_2$ nanosheets in decomposing RhB. Photograph of APTMS modified TiO$_2$ nanosheets dispersed in ethanol is inserted.

**Fig. S4** Light absorption spectra of the cilia film immobilized RGO/TiO$_2$ at the static state and dynamic state (800 r/min).
Fig. S5 Circular reactions of as-prepared artificial cilia film in decomposing RhB at a magnetic actuation speed of 800r/min.

Fig. S6 SEM images of (a) typical cilia surface and (b) the reduced TiO$_2$ density and positive effect of RGO after 15 circular reactions.

Fig. S7 Raman spectra of GO and RGO.