

Supporting information for the manuscript

## TiO<sub>2</sub>-Reduced Graphene Oxide for Removal of Gas-Phase Unsymmetrical Dimethylhydrazine

HOU Ruomeng,<sup>a</sup> JIA Ying,<sup>\*a</sup> HUANG Yuanzheng,<sup>a</sup> SHEN Keke,<sup>a</sup> ZHU Huixin<sup>a</sup>

1 High-Tech Institute of Xi'an, Xi'an 710025, China; hourmhjj@163.com(H.R.); jyingsx@163.com  
(J.Y.); yzh2016edu@126.com (H.Y.); 673550682@qq.com (S.K.); 727657974@qq.com (Z.H.)

\* Correspondence: jyingsx@163.com

### 1. The UV-Vis spectra of TiO<sub>2</sub> and TiO<sub>2</sub>/rGA

The UV-Vis spectra of TiO<sub>2</sub> and TiO<sub>2</sub>/rGA-3 are shown in Fig.S1. In pure TiO<sub>2</sub>, there exists noticeable UV-light absorption ability in 330 nm. The absorption intensity below 380nm is much higher than that above 400nm. The absorption capacity in visible-light is obviously lower than in UV-light. When graphene is added, TiO<sub>2</sub>/rGA-3 composite exhibits remarkable enhancement of the absorption ability in the visible-light region (especially in the range of 600~800 nm). Because the bandgap of graphene is zero and color of graphene is black, TiO<sub>2</sub>/rGA-3 shows similar absorbance from UV light to visible light. What's more, TiO<sub>2</sub>/rGA-1, TiO<sub>2</sub>/rGA-2, TiO<sub>2</sub>/rGA-4, TiO<sub>2</sub>/rGA-5 show the similar curves as TiO<sub>2</sub>/rGA-3.

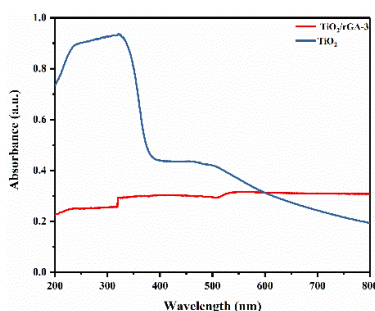


Fig.S1. UV-Vis spectra of TiO<sub>2</sub> and TiO<sub>2</sub>/rGA-3

### 2. The absorption curve of samples in dark under UV light

The experiments in the dark were shown in Fig.S2. TiO<sub>2</sub>/rGA-3 displays the relatively high UDMH conversion in the reactions from the start for more oxygen-containing groups than other samples. Pure absorption of UDMH in dark is easy to reach saturation with only 30mg sample. When the UV light is added, photocatalysis can occur on the surface of sample and UDMH gas adsorbed on the sample can be degraded. Active points can be produced by desorption of UDMH, which further promote the adsorption of flowing UDMH. In this way, dynamic equilibrium of adsorption and photocatalysis achieved.

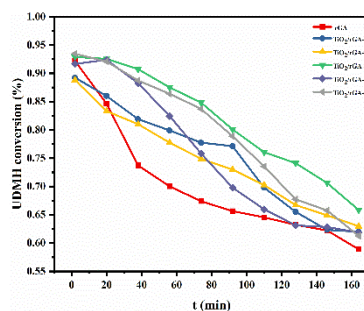


Fig.S2. The absorption curve of samples in dark under UV light