Electronic Supporting Information

Sunlight-Induced Selective Photocatalytic Degradation of Methylene Blue in Bacterial Culture by Pollutant Soot Derived Nontoxic Graphene Nanosheets

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1. Photocatalytic Test:

A detailed aqueous phase photodegradation study of MB[1] under sunlight irradiation for wsGNS and GNS are shown in Figure S1 (a), carried out in different conditions for the comparison purpose. The continuous change in the concentration (concerning the decolourization) of MB by GNS and wsGNS (Figure S1 (a)) in sunlight was observed under at different time intervals using the UV-Vis absorbance spectroscopy. The rate constant data were evaluated from the corresponding experimental data (Figure S1 (a) by assuming pseudo first-order kinetics and the linear fitting of pseudo first-order kinetics is shown in figure S1 (b).

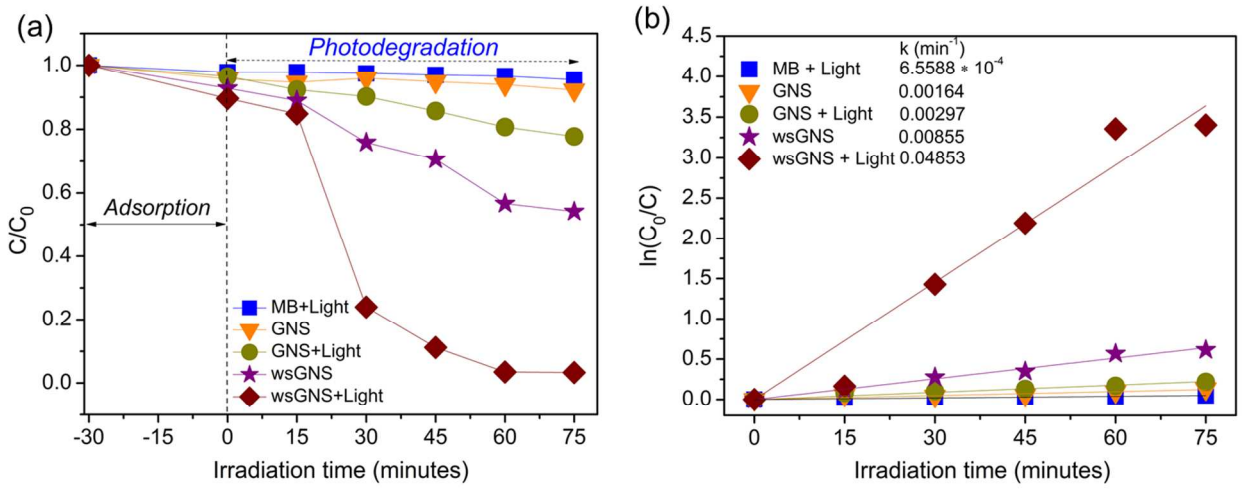

Figure S1: Extent of (a) Plot of C/C_o for MB photodegradation by wsGNS under sunlight irradiation with adsorption as background tests; (b) Plot of $\ln(C_o/C)$ for MB photodegradation by different samples.

2. Table 1: Comparative study of photodegradation performance by different graphene based nano-composites under the influence of sunlight.

S. No.	Materials	Degradation efficiency	Degradation time (minutes)	Rate constant value (min^{-1})	Reference
1.	Graphene-V_2O_5 nanocomposite	99%	90	0.0366	2
2.	Hemin-functionalized graphene hydrogel (Hem/GH)	96 %	180	0.017	3
3	Graphene-SnO_2-PMMA Nanocomposite	99%	60	0.0488	4
4	ZnO flower/reduced graphene oxide composite	97%	150	0.0395	5
5	ZnO-RGO/RuO_2 Nanocomposites	99%	60	-	6
6	Graphene–SnO_2 composites	99%	5	-	7
7	$ZnFe_2O_4$/ZnO nanocomposites on graphene	99%	120	0.0330	8
8	Graphene-$ZnTiO_3$ nanocomposite	>95%	60	-	9
9	Water soluble graphene nanosheets (wsGNS)	97 %	¥60	0.04853	**Present study**
		99.9%	±90		

¥*Based on the UV-visible absorption spectroscopy as described in Figure 3.*

± *Based on NMR results as described in Figure 7.*

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