

Supporting information

RGO-ZnTe: A Graphene Based Composite for Tetracycline Degradation and their Synergistic Effect

Koushik Chakraborty¹, Tanusri Pal² and Surajit Ghosh^{1,*}

¹Department of Physics and Technophysics, Vidyasagar University, Midnapore 721102, India

²Department of Physics, Midnapore College, Midnapore 721101, India

*Corresponding author: surajit@mail.vidyasagar.ac.in

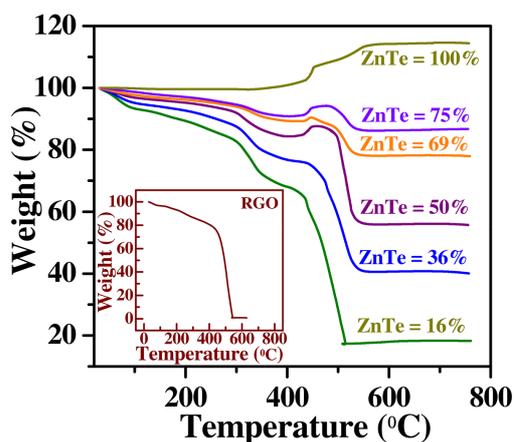


Figure S1 The TGA curves of prepared of RGO–ZnTe composite with different weight percentage of ZnTe in the composite. The TGA curve of RGO is shown in the inset.

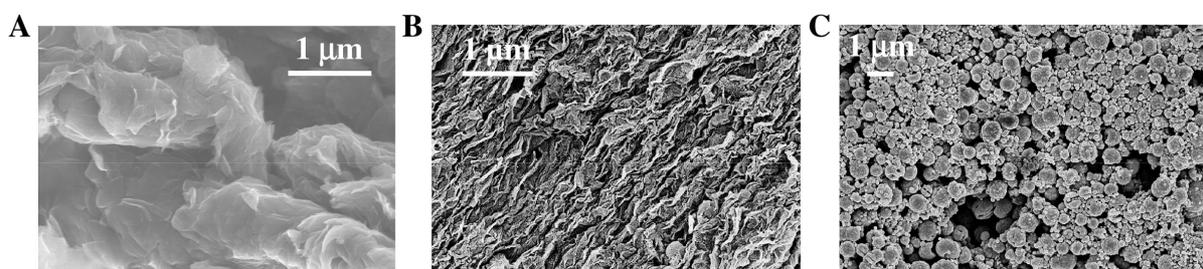


Figure S2 SEM image of (A) GO, (B) RGO and (C) Controlled-ZnTe

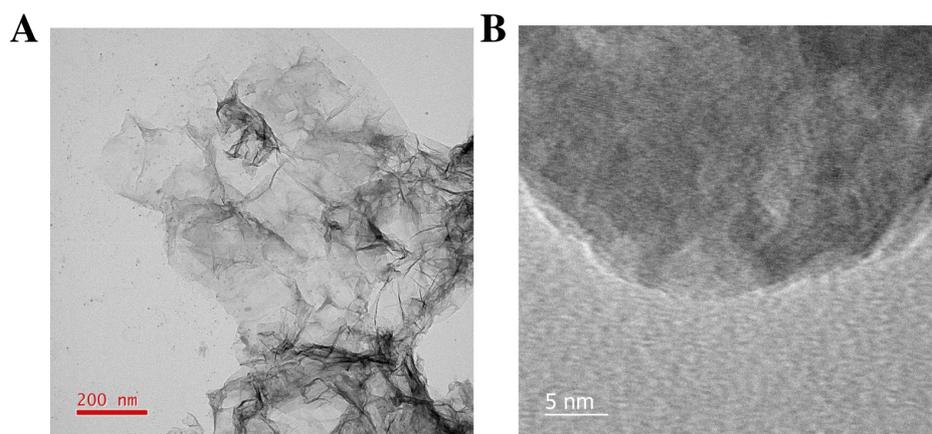


Figure S3 (A) TEM image of RGO and (B) HRTEM image of RGO-ZnTe composite

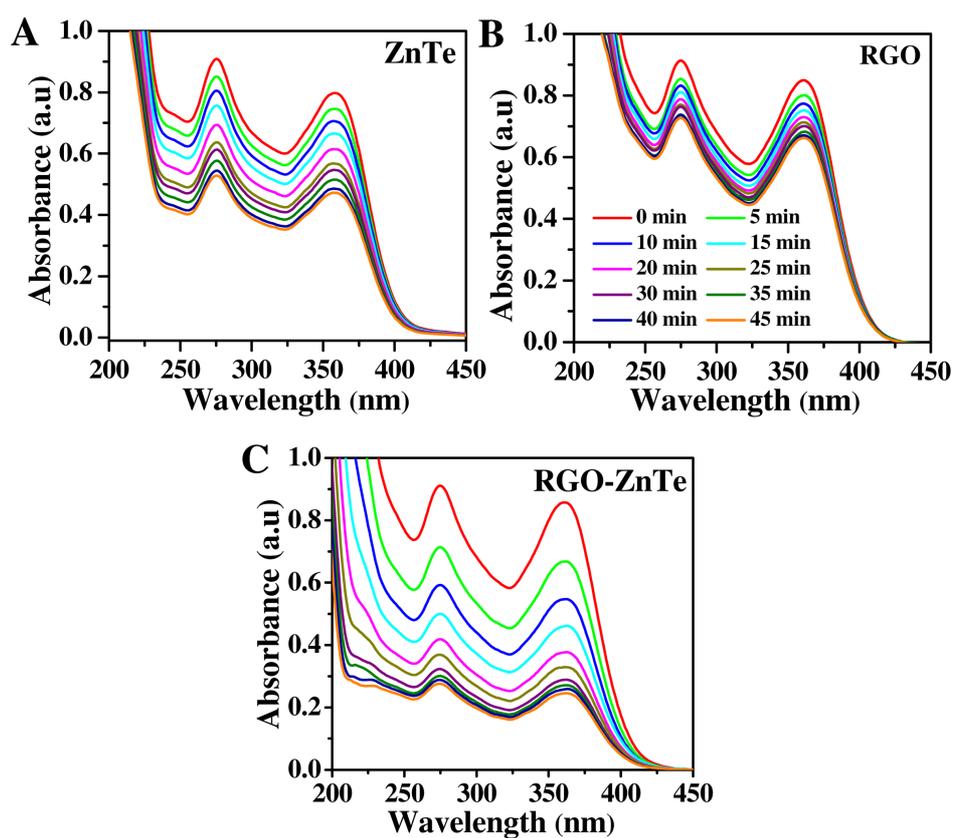


Figure S4 UV-vis absorption spectra of aqueous solution of TC containing (A) controlled ZnTe (B) RGO and (C) the RGO-ZnTe composite for different times of simulated solar light illumination.

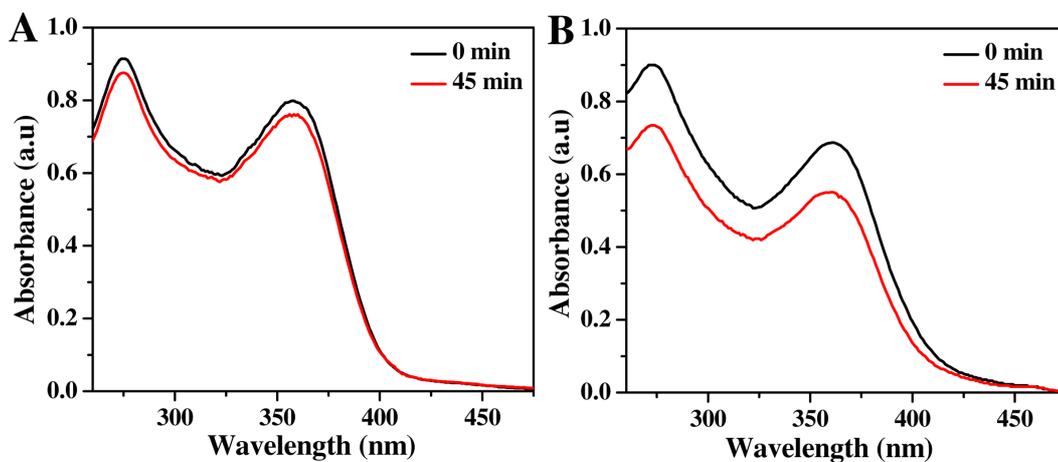


Figure S5 UV-vis absorption spectrum of aqueous solution of TC (A) under light illumination without catalyst and (B) with RGO-ZnTe catalyst under dark condition.

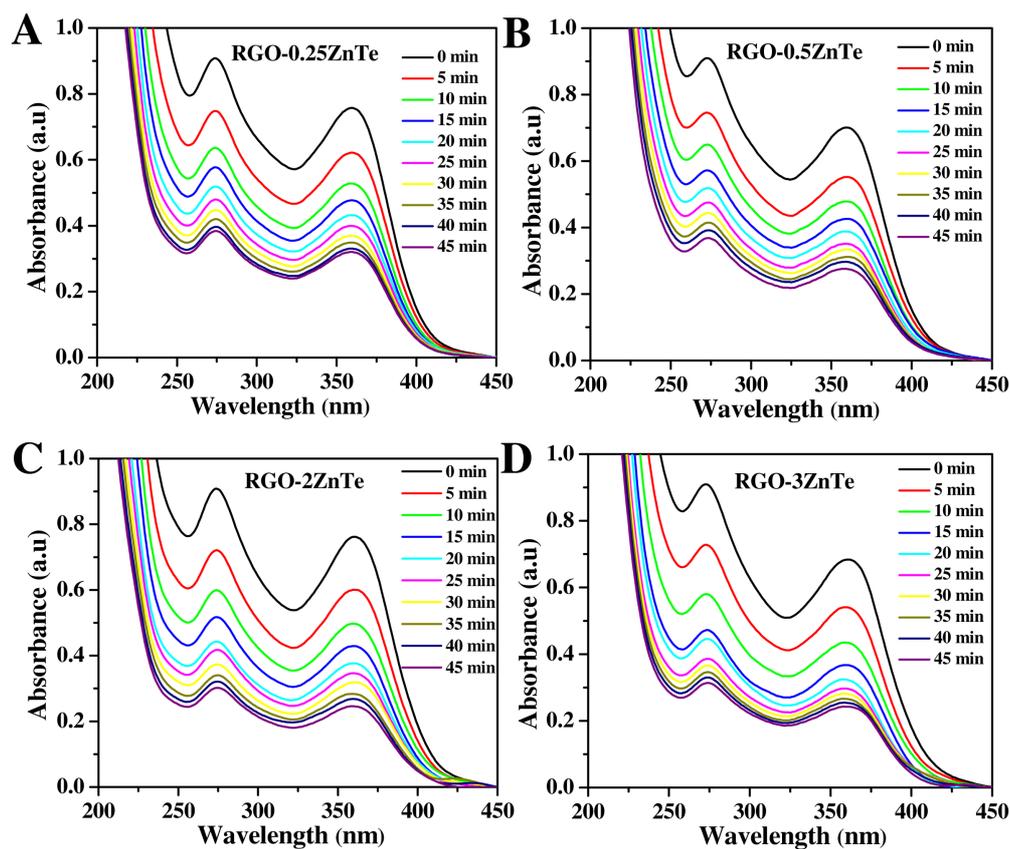


Figure S6 UV-vis absorption spectrum of aqueous solution of TC containing (A) RGO-0.25ZnTe (B) RGO-0.5ZnTe (C) RGO-2ZnTe and (D) RGO-3ZnTe for different times of simulated solar light illumination.

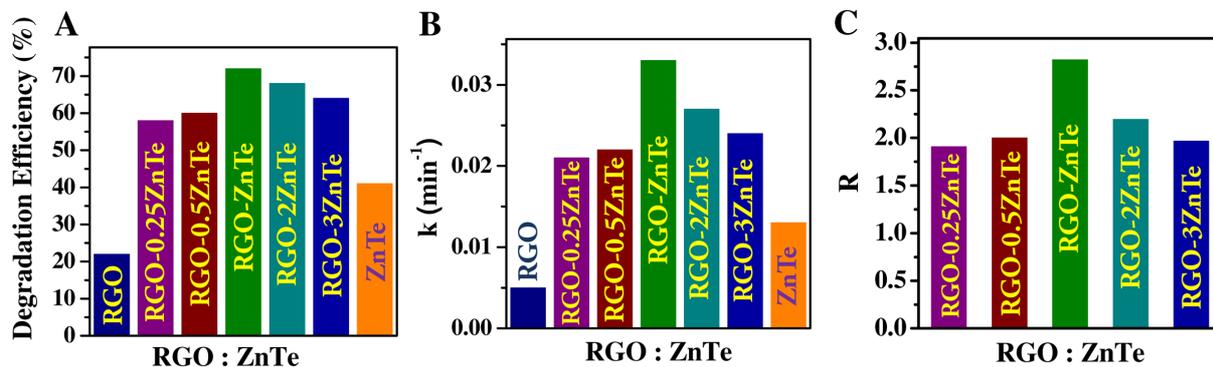


Figure S7 The comparison of the (A) photo degradation efficiency (B) k and (C) R with varying ratio of RGO and ZnTe in the RGO-ZnTe composite.

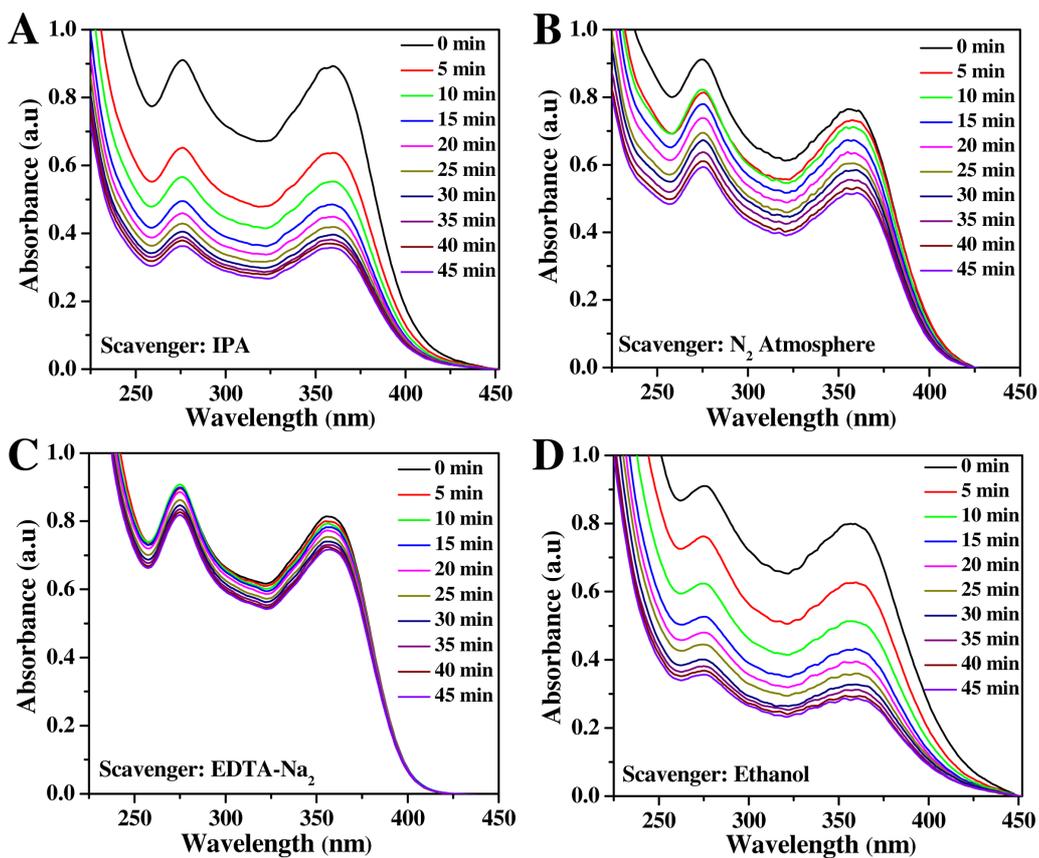


Figure S8 UV-vis absorption spectrum of aqueous solution of TC and RGO-ZnTe in presence of (A) Isopropyl Alcohol (B) N₂ Atmosphere (C) EDTA-Na₂ (D) Ethanol.

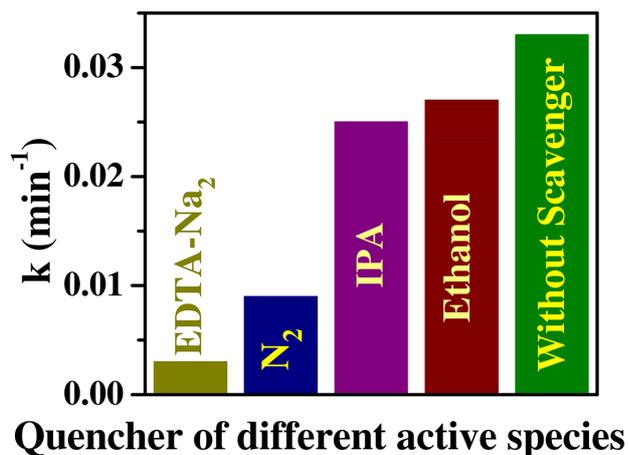


Figure S9 Comparison of the values of k , of the RGO–ZnTe photocatalyst in presence of different scavengers.

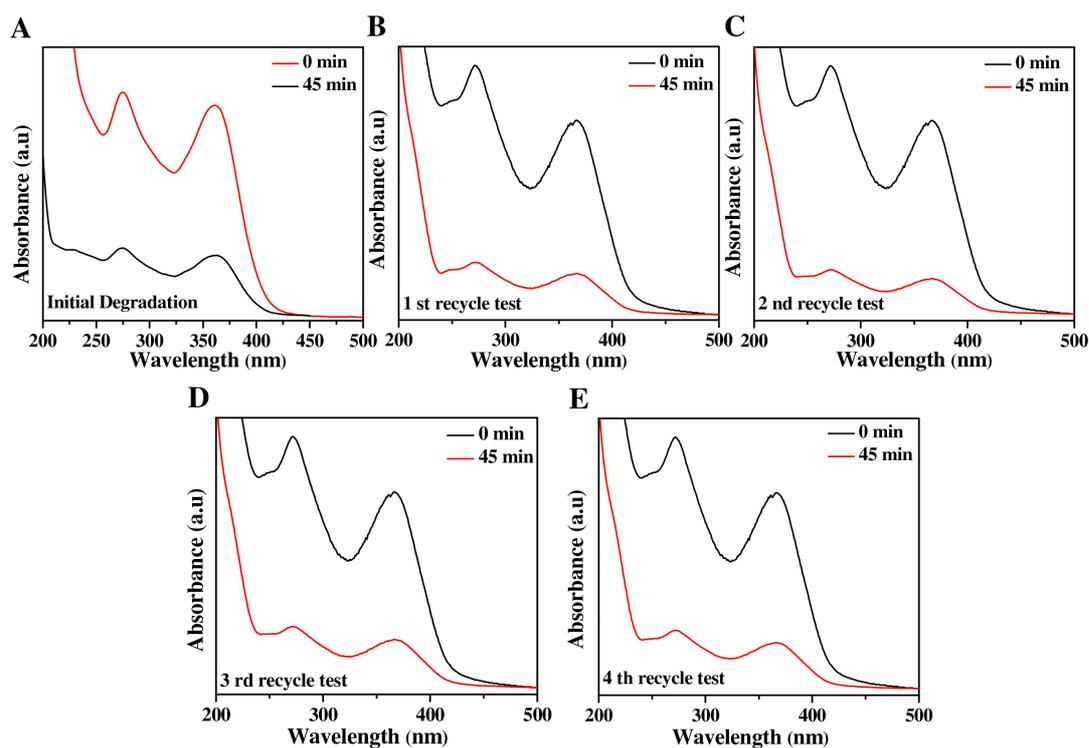


Figure S10 UV-vis absorption spectra for (A) initial degradation (B) 1st recycle use (C) 2nd recycle use (D) 3rd recycle use (E) 4th recycle use of RGO–ZnTe composite towards the degradation of TC in aqueous solution.

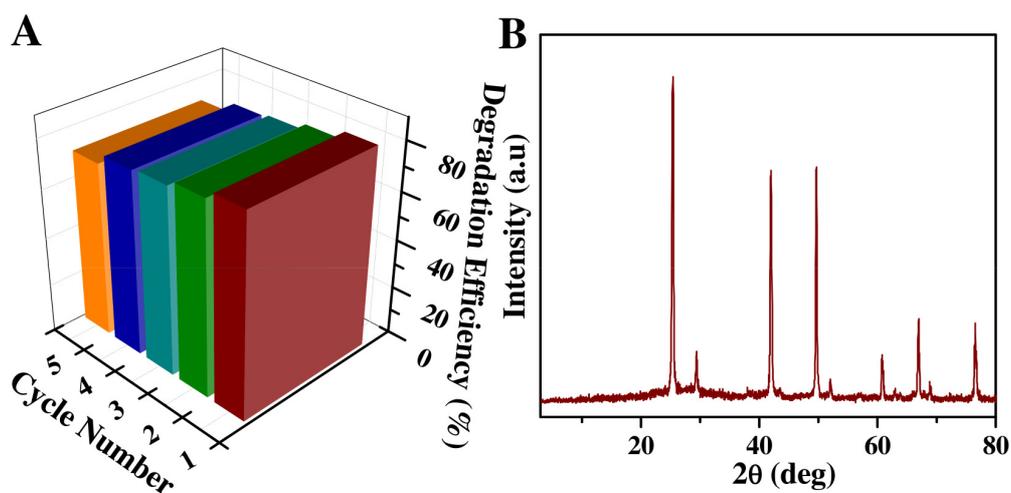


Figure S11 (A) Photodegradation efficiency of RGO-ZnTe composite for different degradation cycle. (B) XRD pattern of the RGO-ZnTe composite after five cycles of degradation of TC in aqueous solution.

Table S1 Comparison of TC degradation capacity of RGO-ZnTe with other photocatalysts

Catalyst used	Amount of TC	Amount of catalyst	Technique	Light source	Irradiation time	Result	Ref
Pt/WO ₃	2 mg	0.1 gm	Photocatalysis	Visible	1 h	73%	<i>Ind. Eng. Chem. Res.</i> 2014 , 53, 5443–5450.
TiO ₂ nanopore array electrode	0.2 mg	-	Photoelectro catalytic	UV-254nm	3h	80%	<i>J. Hazard. Mater.</i> 2009 , 171, 678–683.
AgCl/Ac composite	2 mg	0.2 gm	Photocatalysis	Visible	1 h	97.3%	<i>J. Ind. Eng. Chem.</i> 2016 , 35, 83-92.
Nanosized TiO ₂	4 mg	0.1 gm	Photocatalysis	UV	1 h	95%	<i>Chemosphere</i> 2013 , 92, 925–932.
RGO-ZnTe	1 mg	0.2 gm	photocatalysis	Visible	40 min	80%	Present Work