

Supplementary Information (SI)

Activated charcoal modified Ag/Cu-anatase TiO₂ for superior photocatalytic degradation of Doxycycline under visible-solar light irradiation

Kirti Bisht, Davinder Kaur, Bonamali Pal*

*Department of Chemistry and Biochemistry, Thapar Institute of Engineering and Technology,
Patiala, Punjab 147004, India*

*Corresponding author Email: bpal@thapar.edu

Materials and methods:

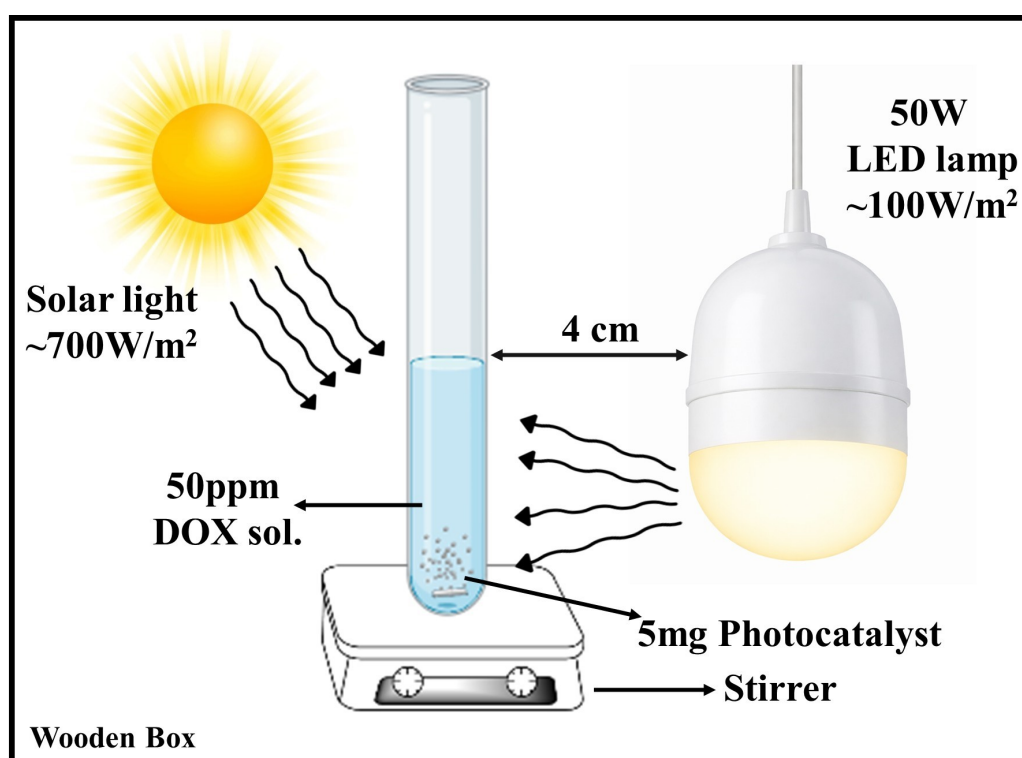


Fig. S1: Setup of photodegradation experiment carried out under either Visible light or Solar light irradiation

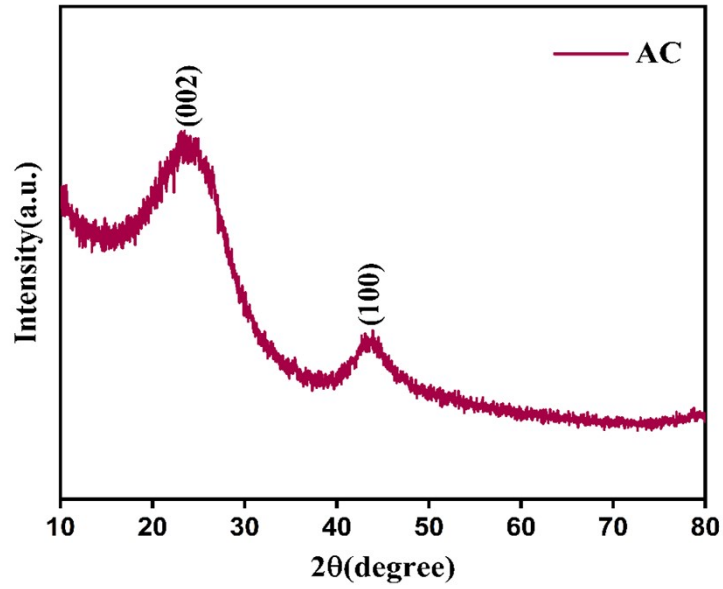


Fig. S2: X-ray diffraction pattern of activated charcoal

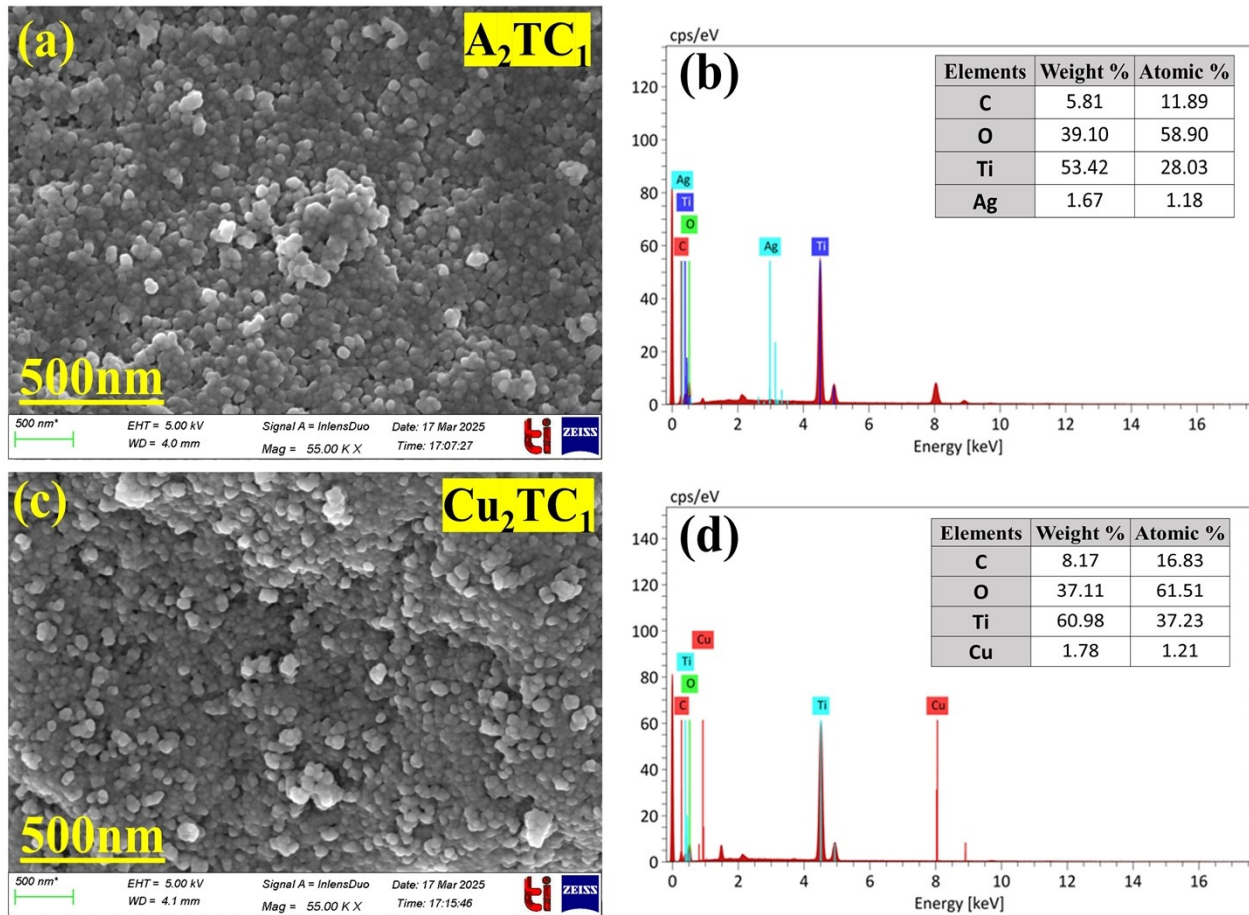


Fig. S3: FESEM images and EDS spectra of (a-b) AC(1wt%)-Ag(2wt%)-TiO₂, (c-d) AC(1wt%)-Cu(2wt%)-TiO₂

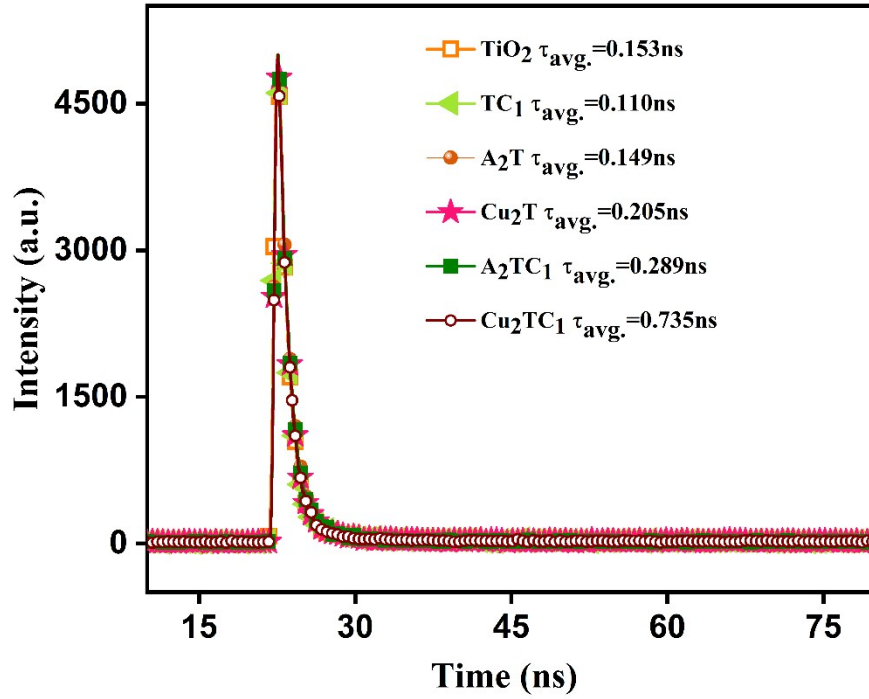


Fig. S4: TRPL decay profile of different prepared composites

Samples	A	T1	T2	T3	Chi Sq.	$\tau_{avg.}(ns)$
TiO₂	25.746	1.103	7.659	0.144	0.944	0.153
TC₁	21.325	0.052	0.110	0.110	1.609	0.110
A₂T	23.465	2.115	8.865	0.148	1.077	0.149
Cu₂T	25.699	0.210	1.139	0.201	1.102	0.205
A₂TC₁	21.321	2.760	2.773	0.092	1.064	0.289
Cu₂TC₁	24.227	0.744	0.744	0.153	1.050	0.735

Table S1: Fluorescence Lifetime Parameters of various synthesized composites.

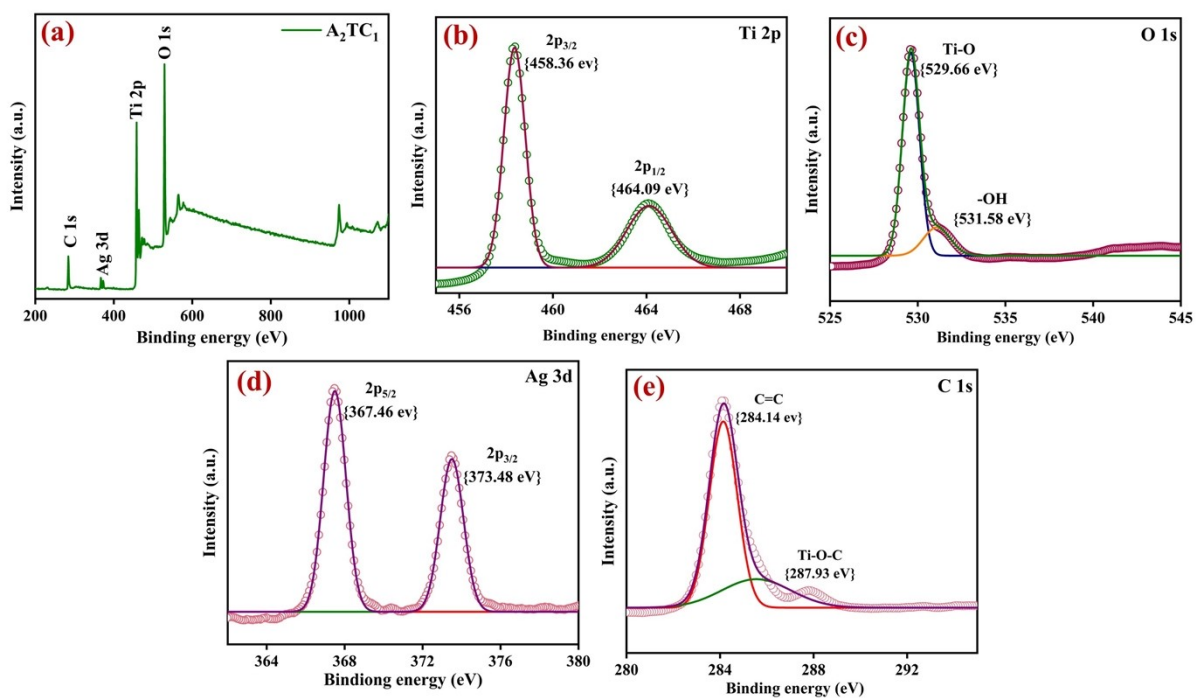


Fig. S5: XPS spectrum of A_2TC_1 composite; (a) elemental survey spectrum, (b) Ti 2p, (c) O 1s, (d) Ag 3d, (e) C 1s

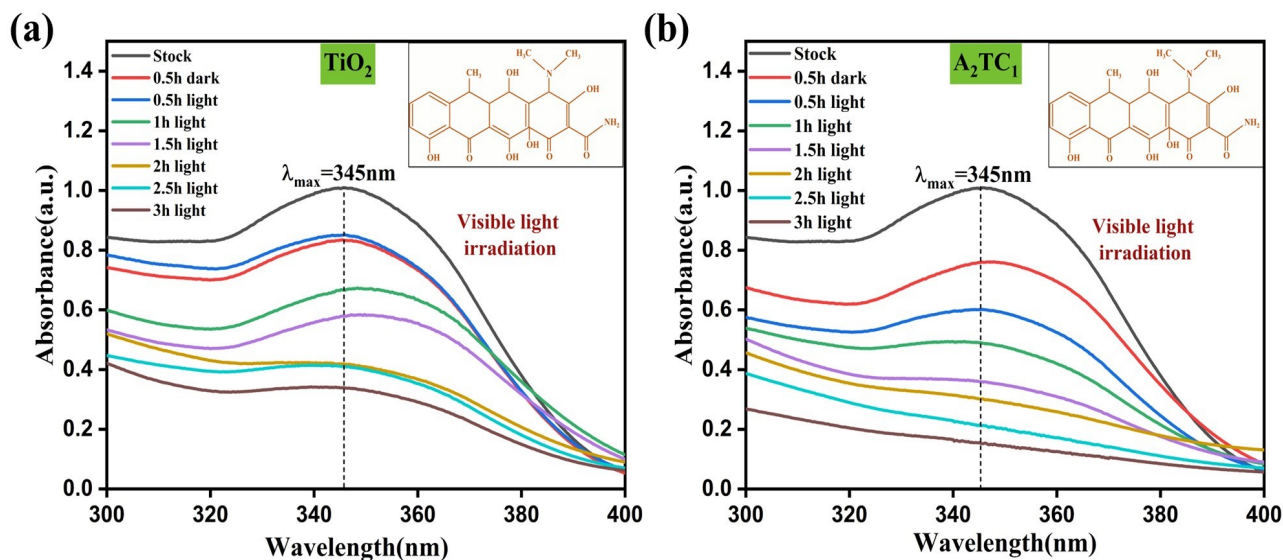


Fig. S6: (a) The absorbance spectra of doxycycline during photocatalytic degradation under visible light by (a) bare TiO_2 , (b) A_2TC_1 composite

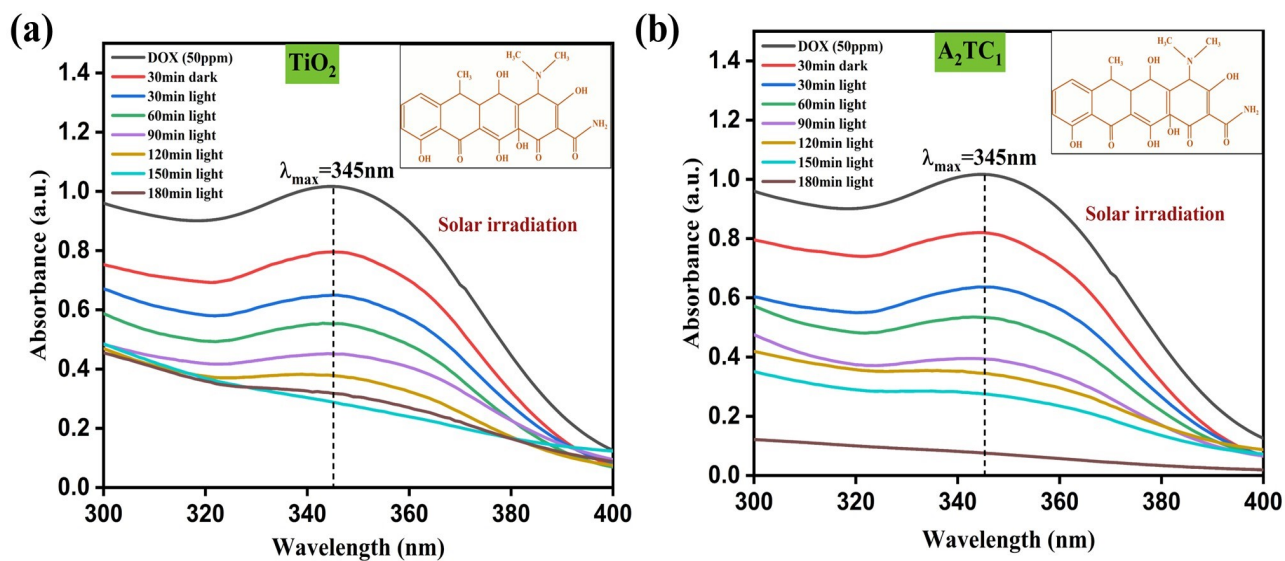
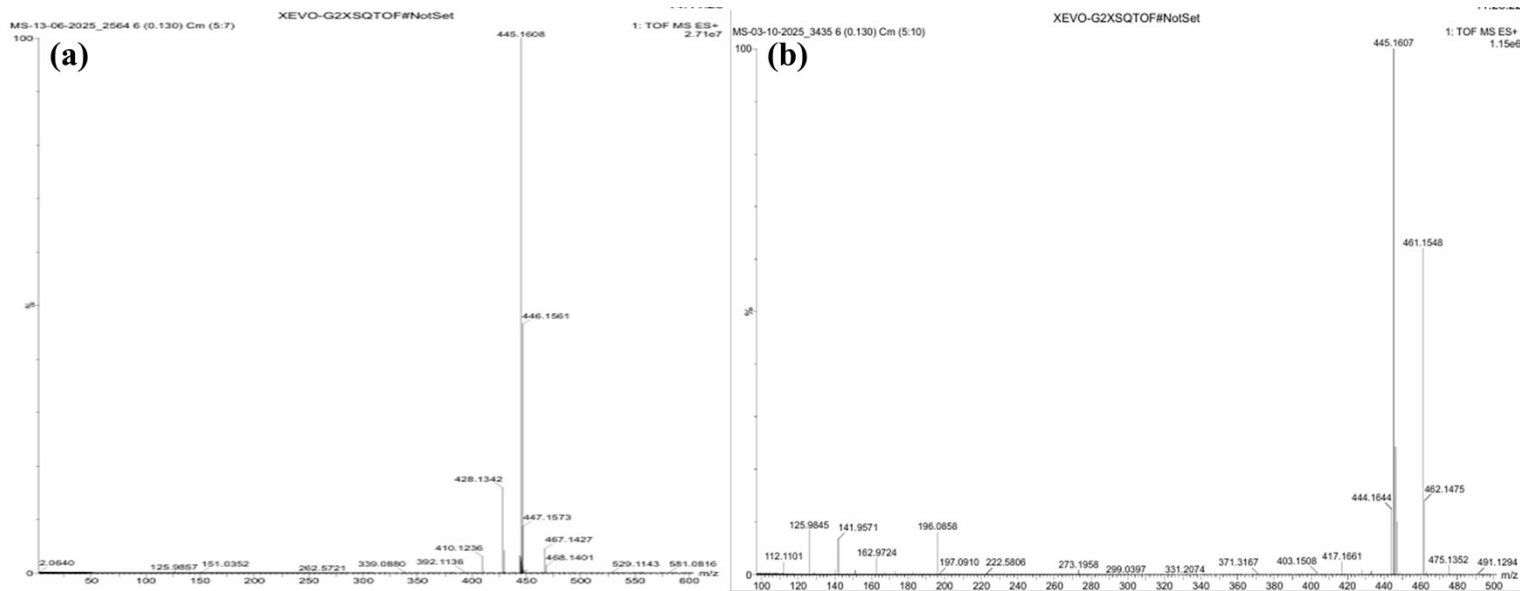


Fig. S7: (a) The absorbance spectra of doxycycline during photocatalytic degradation under solar light by (a) bare TiO_2 , (b) A_2TC_1 composite



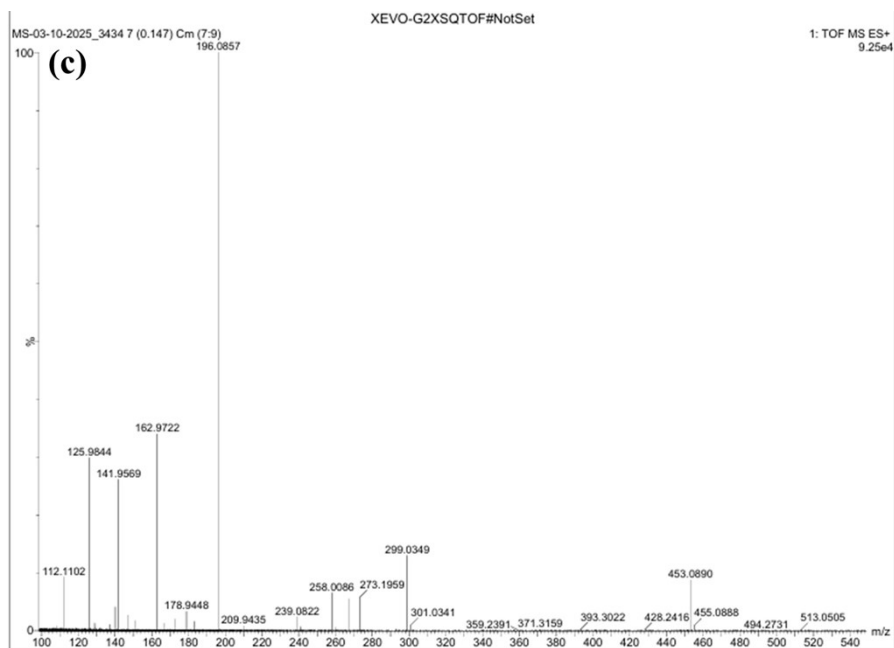


Fig. S8: HR-MS chromatograms and intermediates formed during photocatalytic degradation of doxycycline (a) before degradation, (b) after 90 minutes, (c) after 180 minutes