

SUPPLEMENTARY DATA

Kazi et al.

Research Article

Photolysis of Tolfenamic Acid in Aqueous and Organic Solvents: A Kinetic Study

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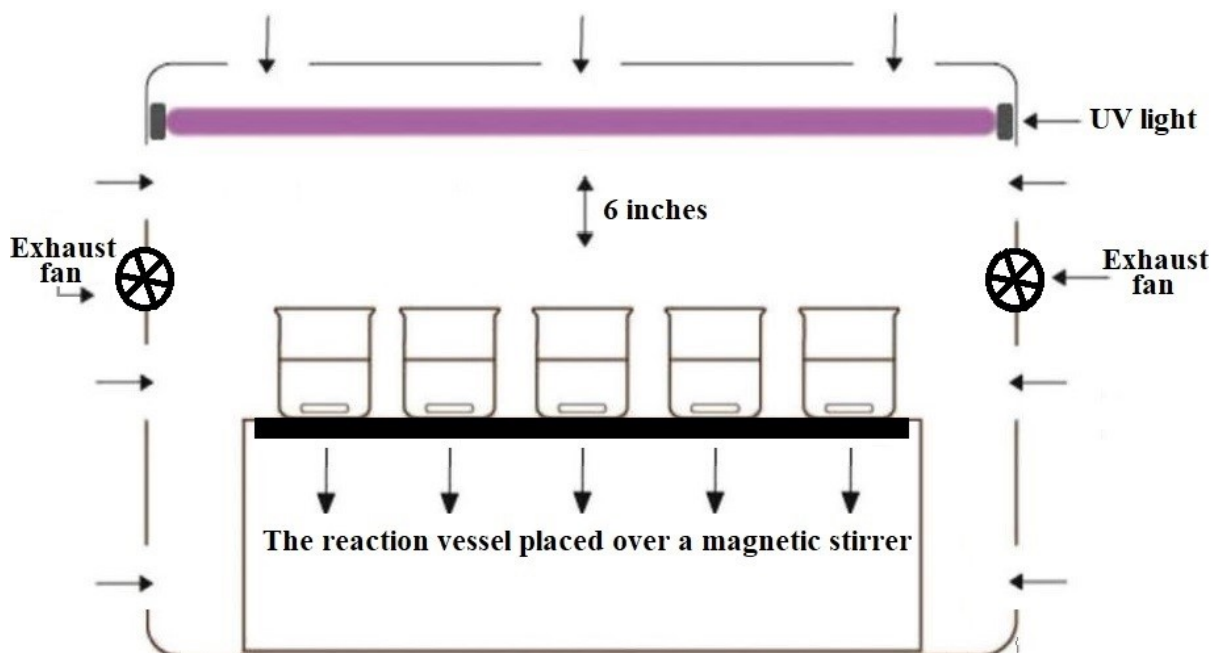


Fig. S1. A diagrammatic representation of the perforated radiation chamber. The arrows indicate the perforations used for the fresh air circulation along with the exhaust fans.

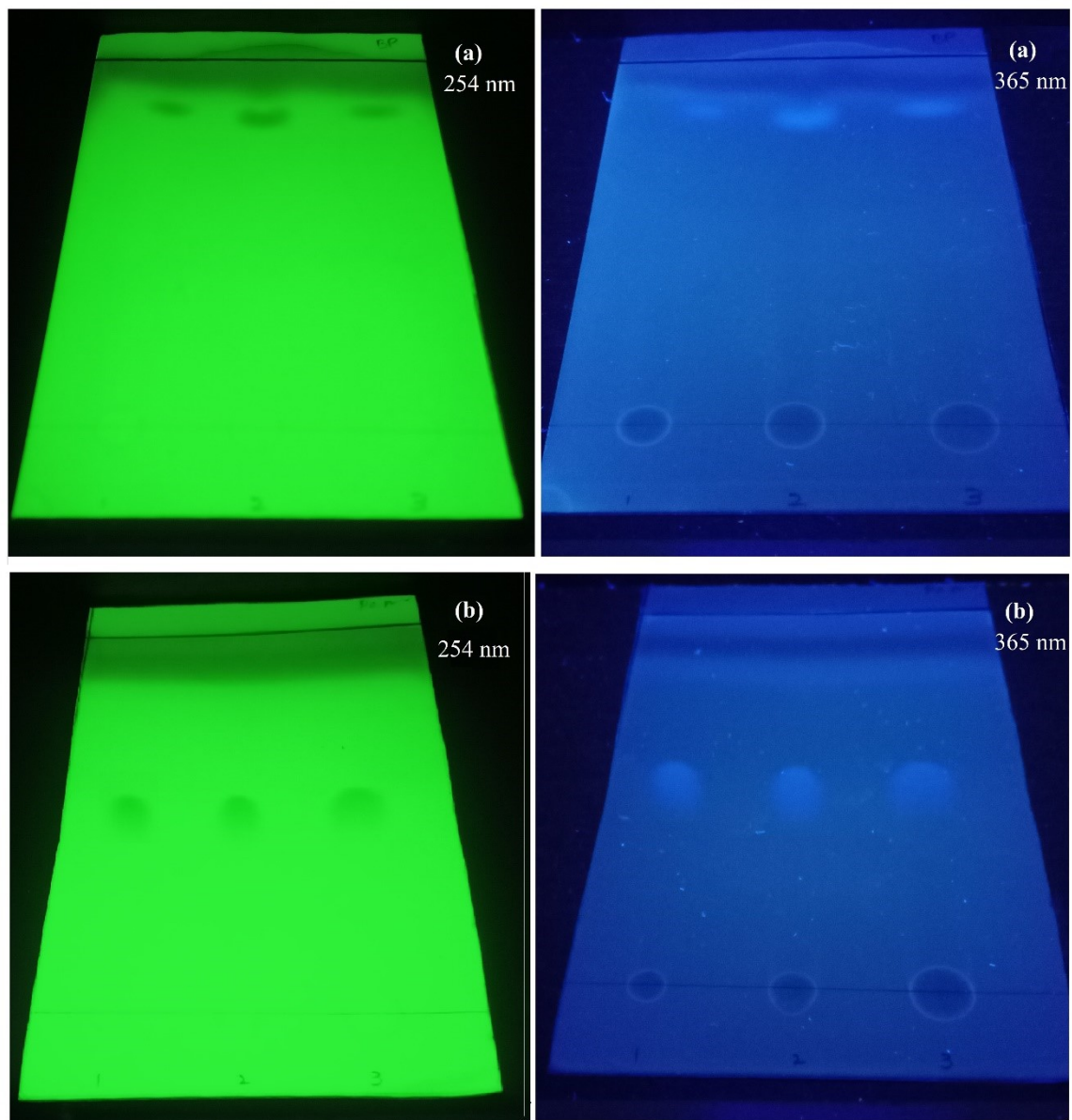


Fig. S2. TLC plates of TA at 254 and 365 nm. (a) British Pharmacopoeia [28] (b) Abdelwahab et al. [33].

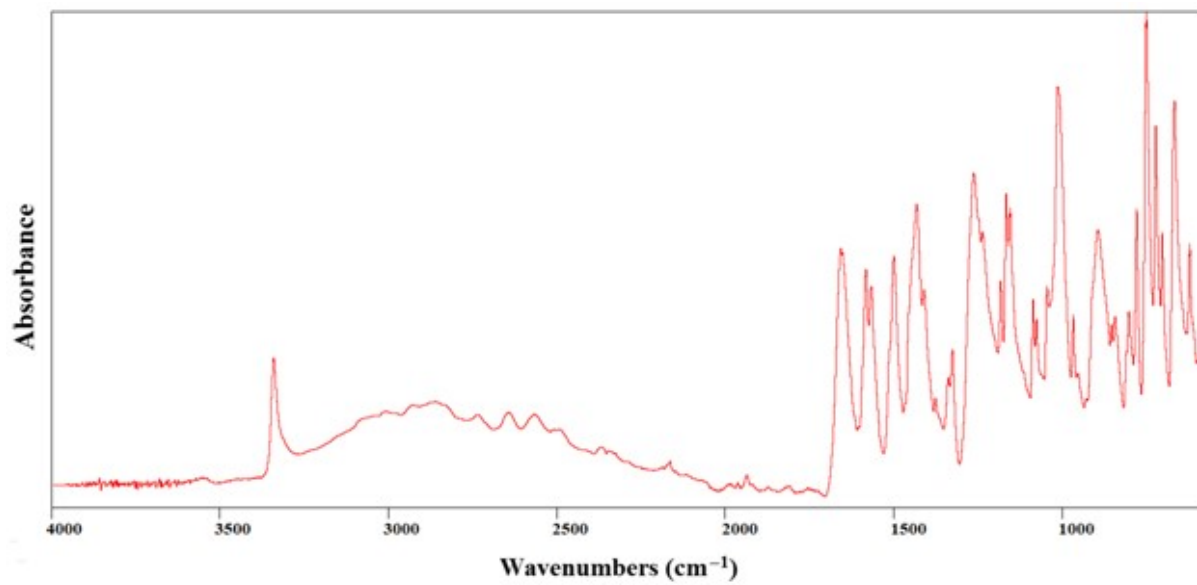


Fig. S3. Structure and FTIR spectrum of TA.

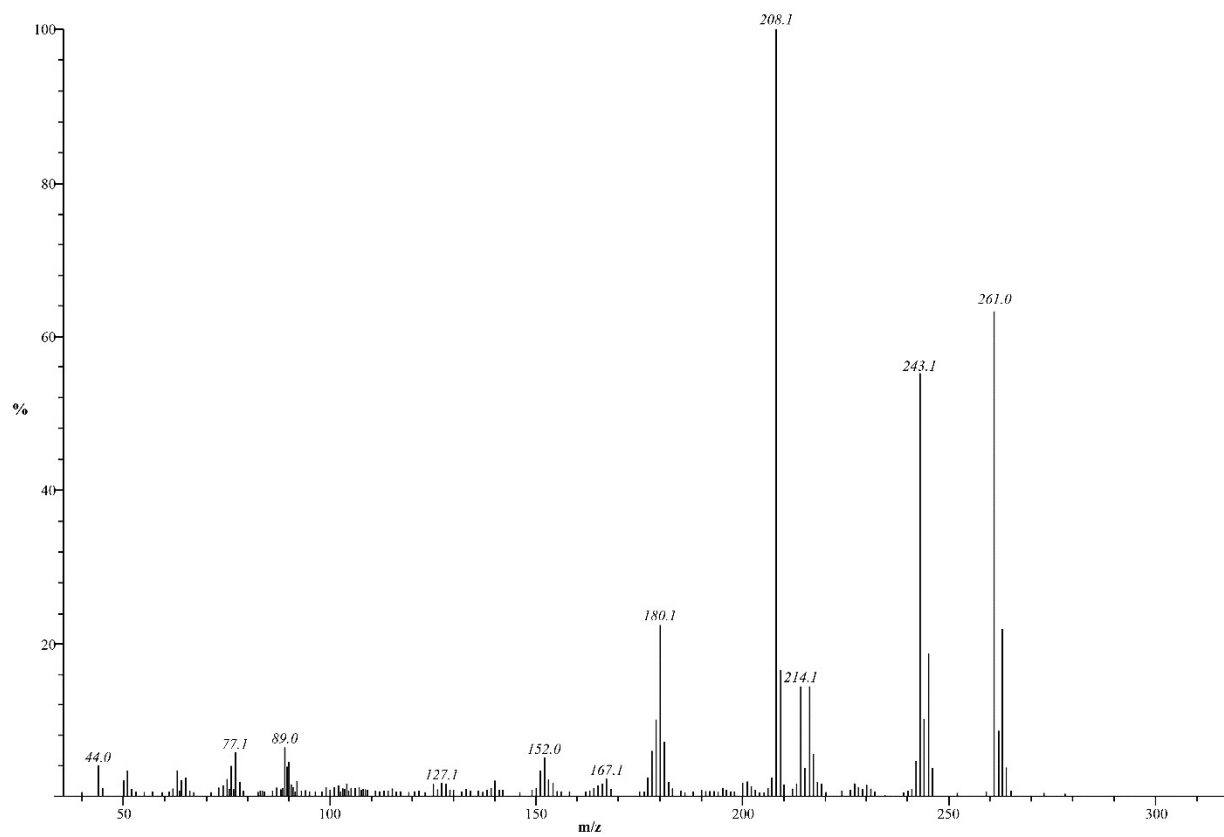


Fig. S4. The mass spectrum of TA.

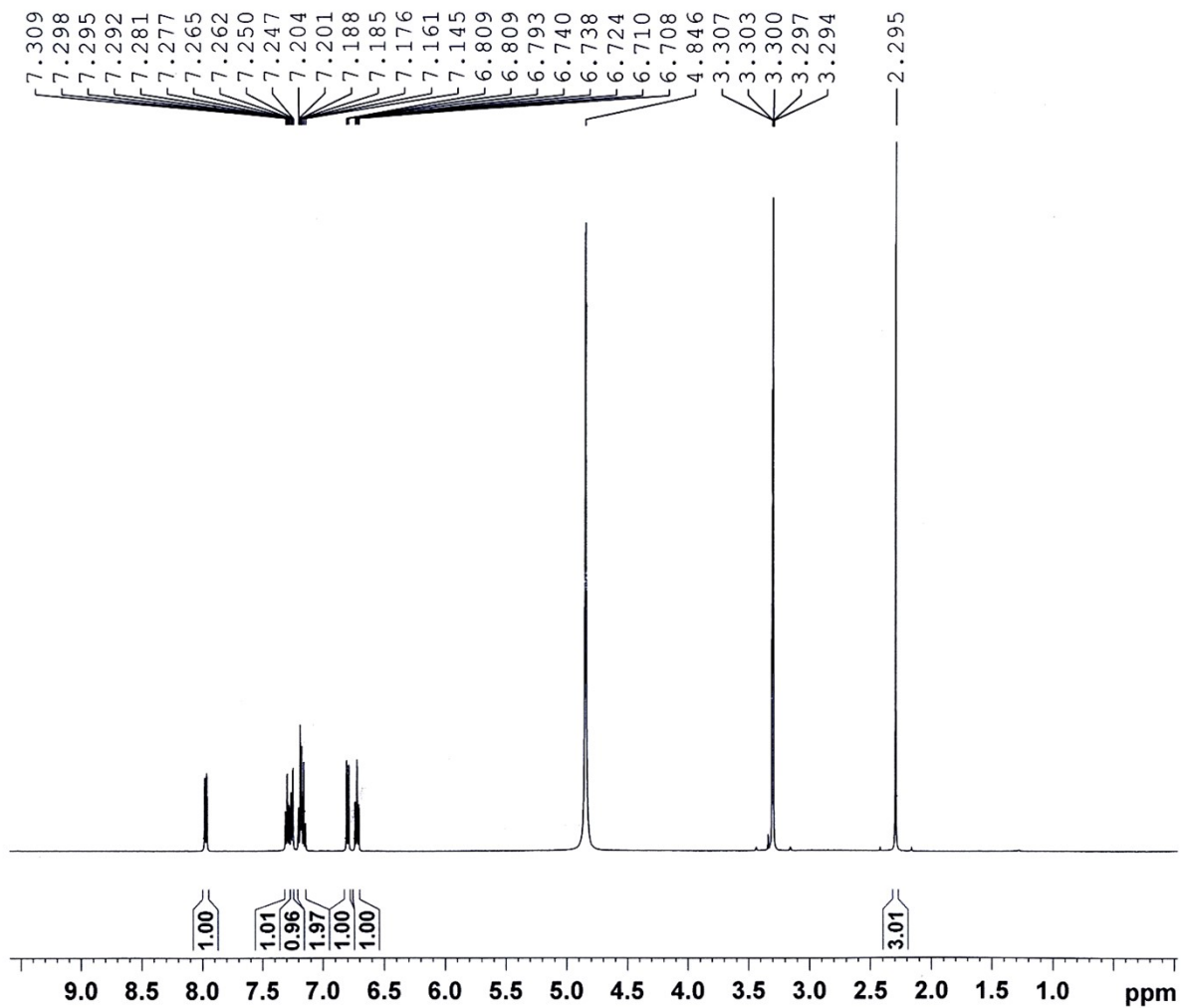


Fig. S5. ^1H NMR spectrum of TA.

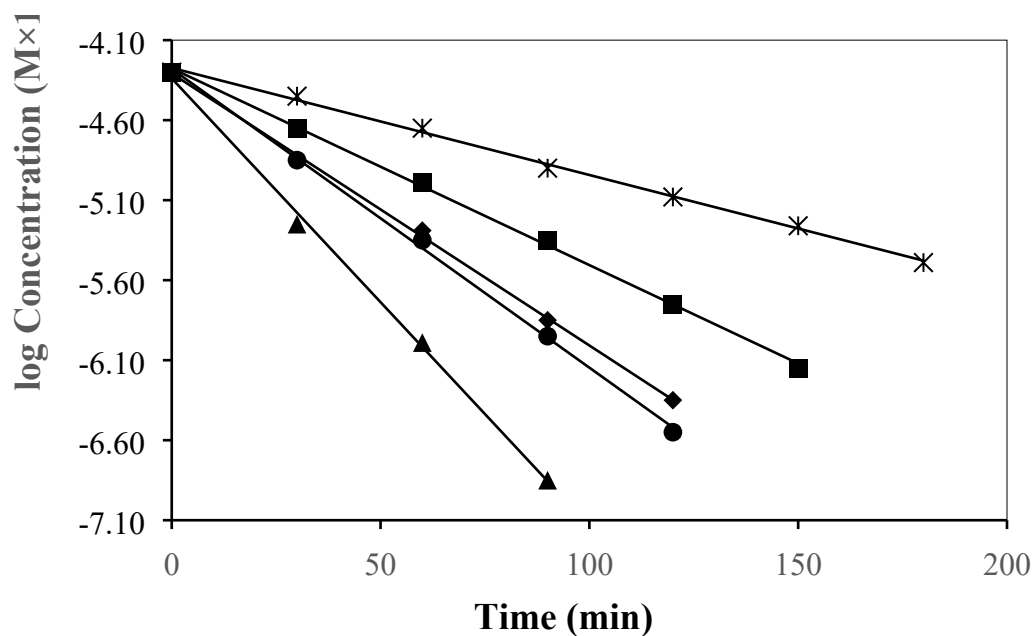


Fig. S6. Apparent first-order plots for the photolysis of TA at pH: (●) 2.0; (▲) 3.0; (◆) 4.0; (■) 5.0; (*) 6.0.

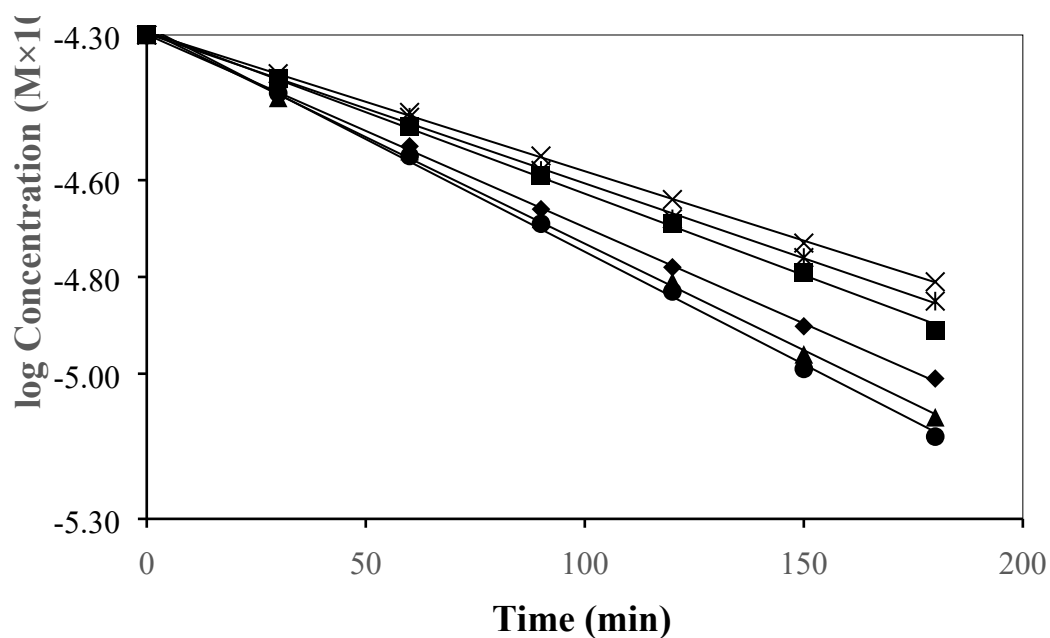


Fig. S7. Apparent first-order plots for the photolysis of TA at pH: (●) 7.0; (▲) 8.0; (◆) 9.0; (■) 10.0; (*) 11.0; (×) 12.0.

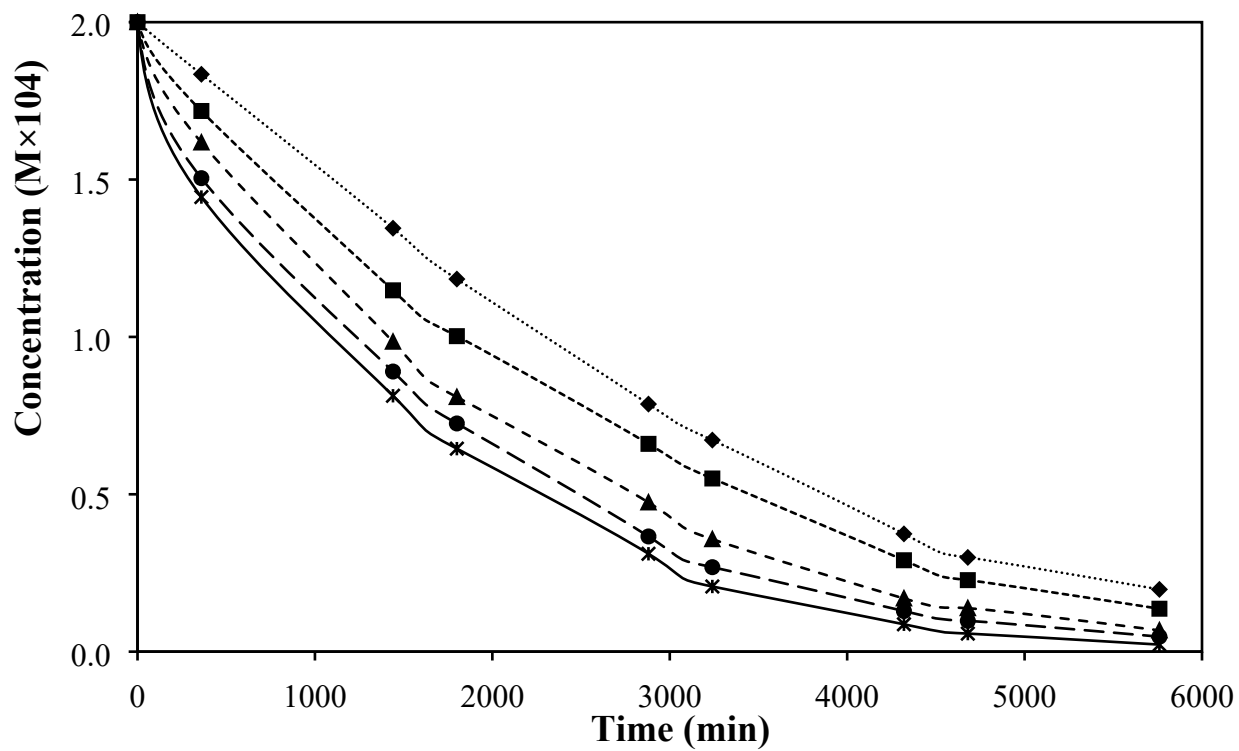


Fig. S8. The photolysis plots of TA in various organic solvents (2.0×10^4 M).
(*) Acetonitrile, (●) Methanol, (▲) Ethanol, (■) Propanol, and (◆) Butanol.

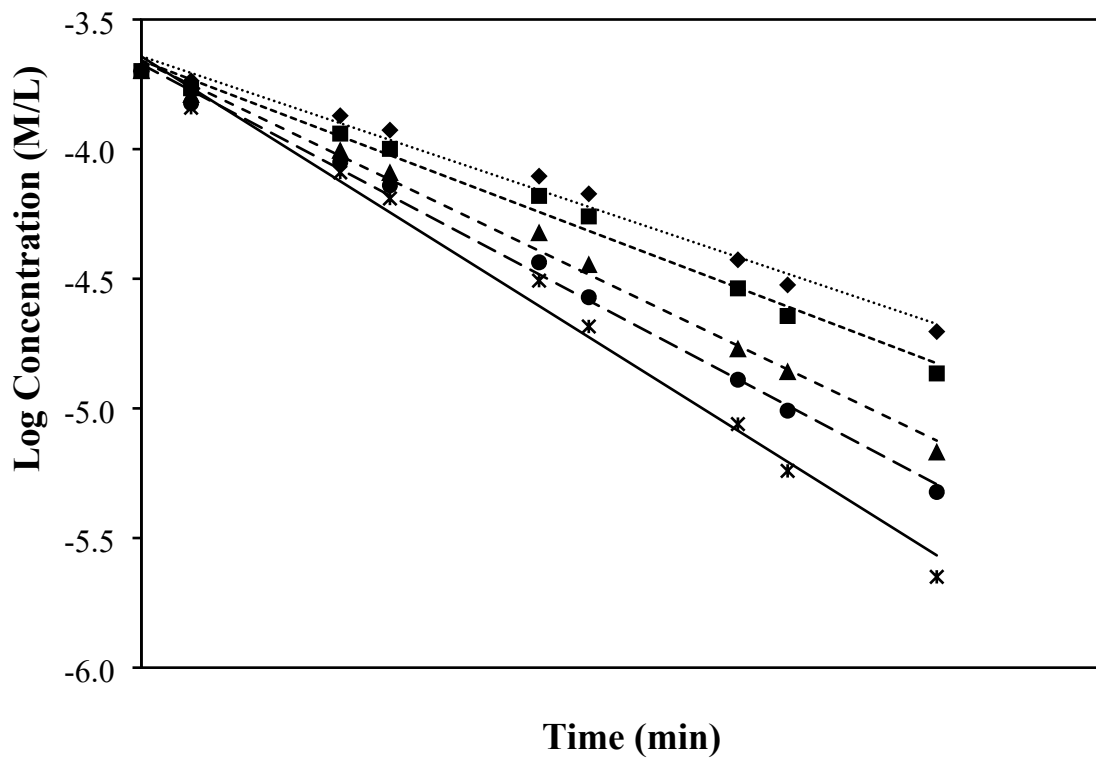


Fig. S9. Apparent first-order plots for the photolysis of TA in various organic solvents. (* Acetonitrile, (●) Methanol, (▲) Ethanol, (■) Propanol, and (◆) Butanol.

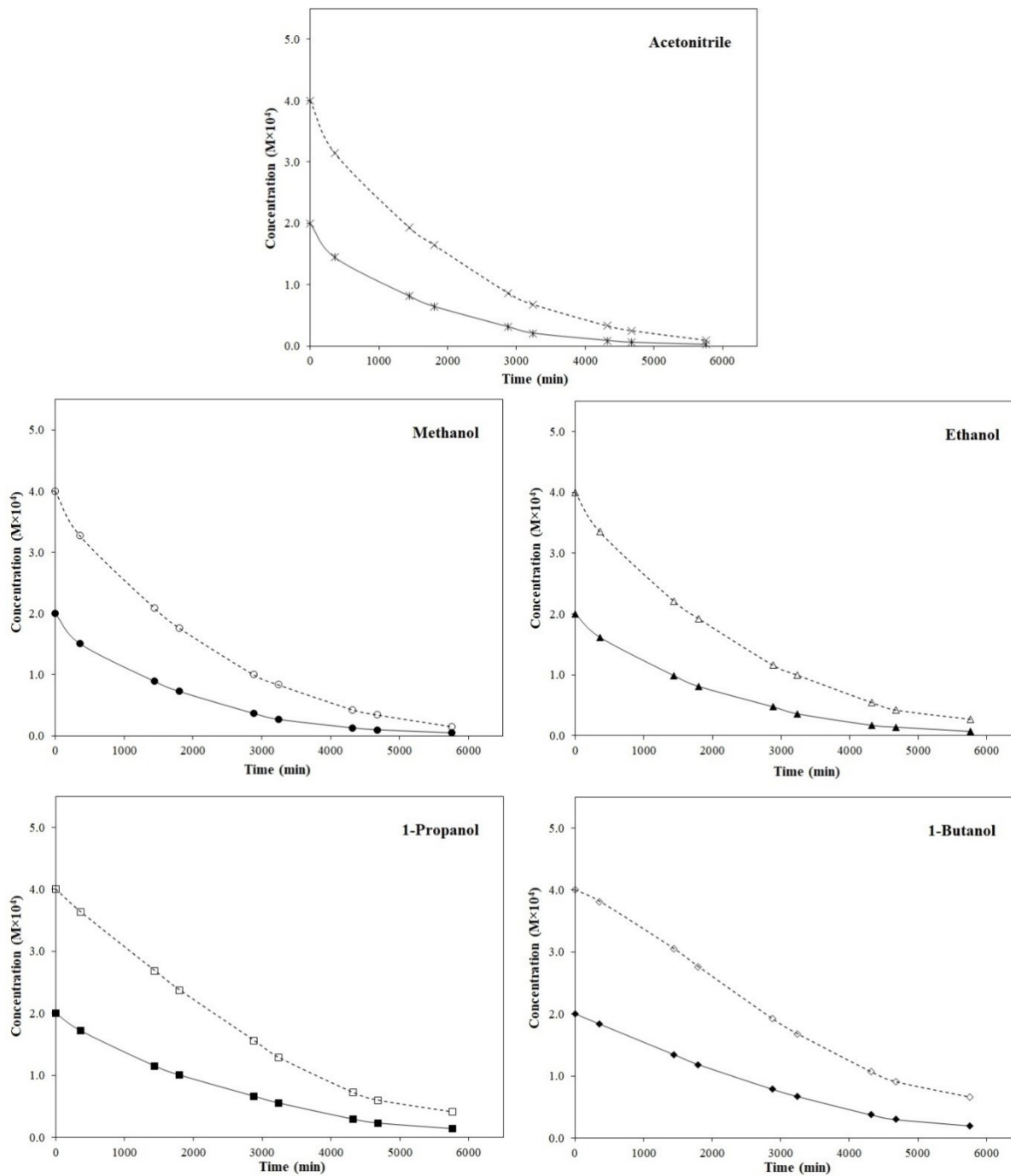


Fig. S10. The comparative plots of the photolysis of TA concentrations in various organic solvents. (—) 2.0×10^4 M (-----) 4.0×10^4 M.

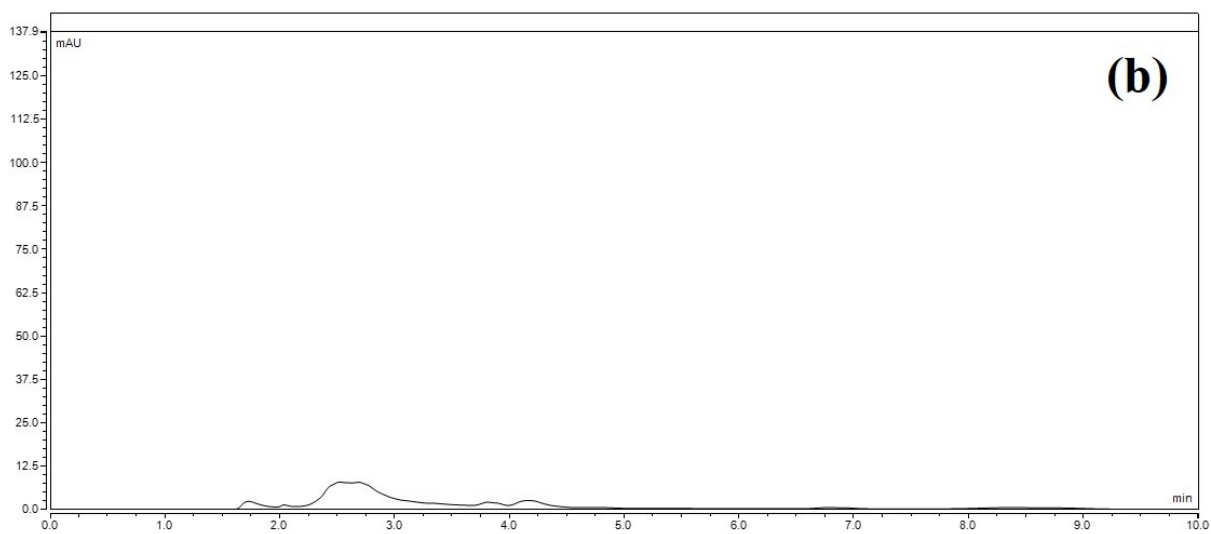
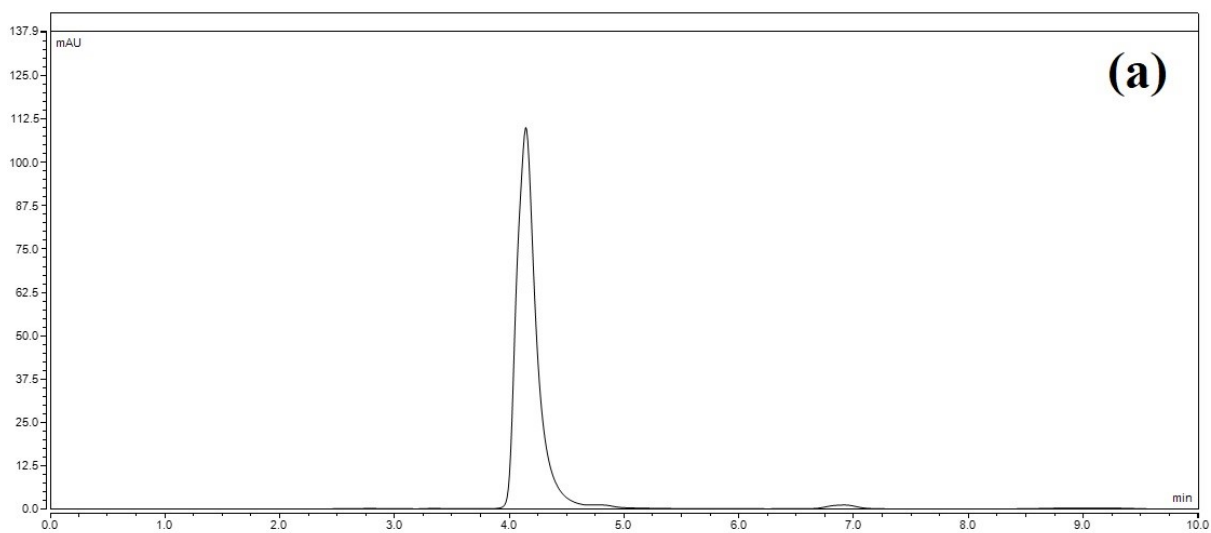


Fig. S11. HPLC chromatogram of TA in acetonitrile at (a) 0 h and (b) after 96 h irradiation.

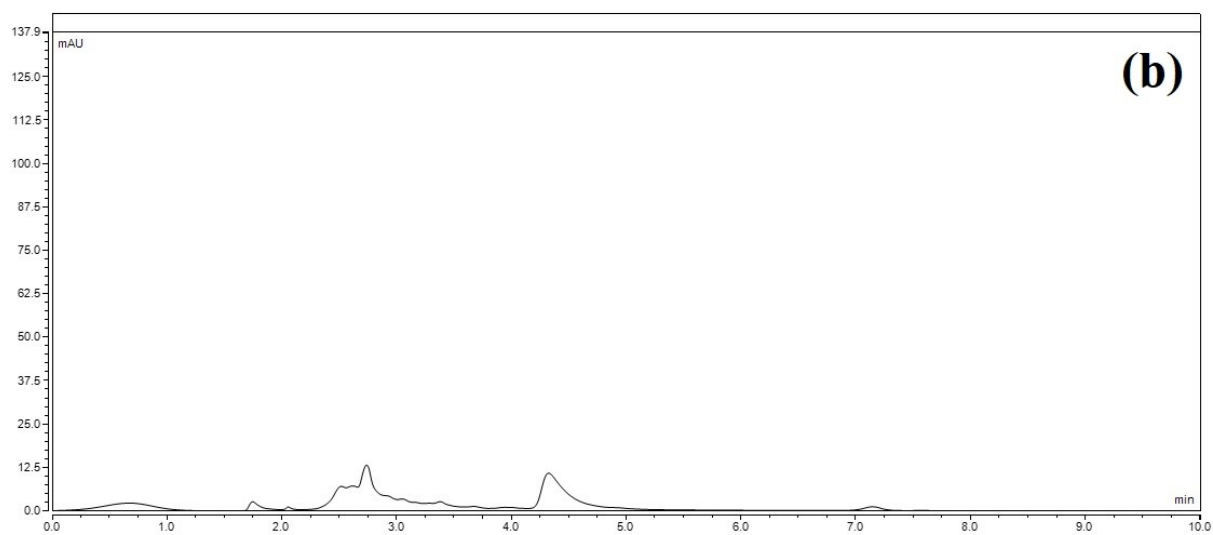
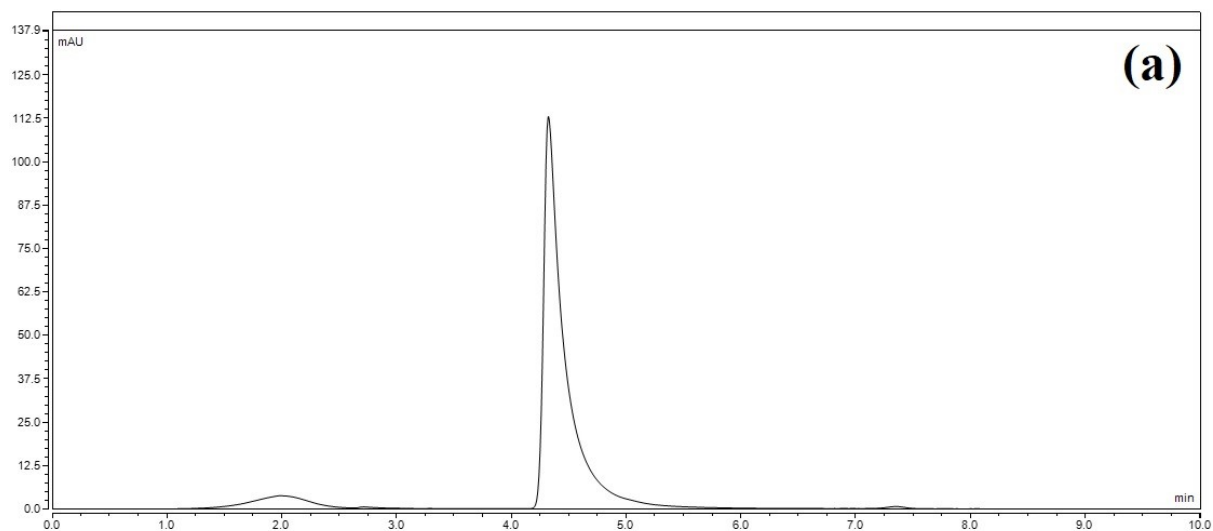


Fig. S12. HPLC chromatogram of TA in methanol at (a) 0 h and (b) after 96 h irradiation.

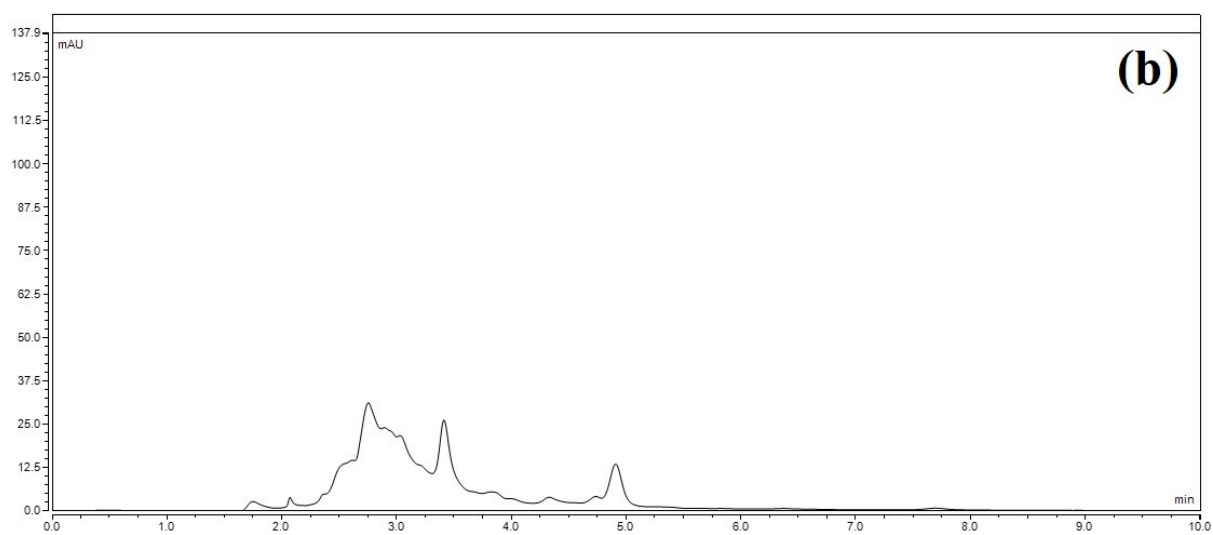
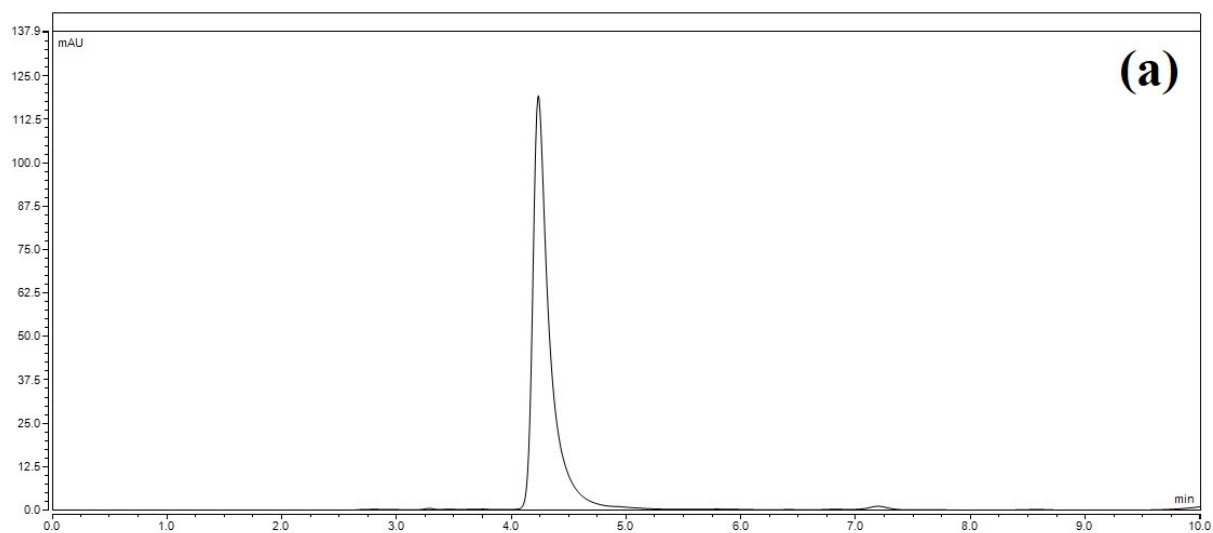


Fig. S13. HPLC chromatogram of TA in ethanol at (a) 0 h and (b) after 96 h irradiation.

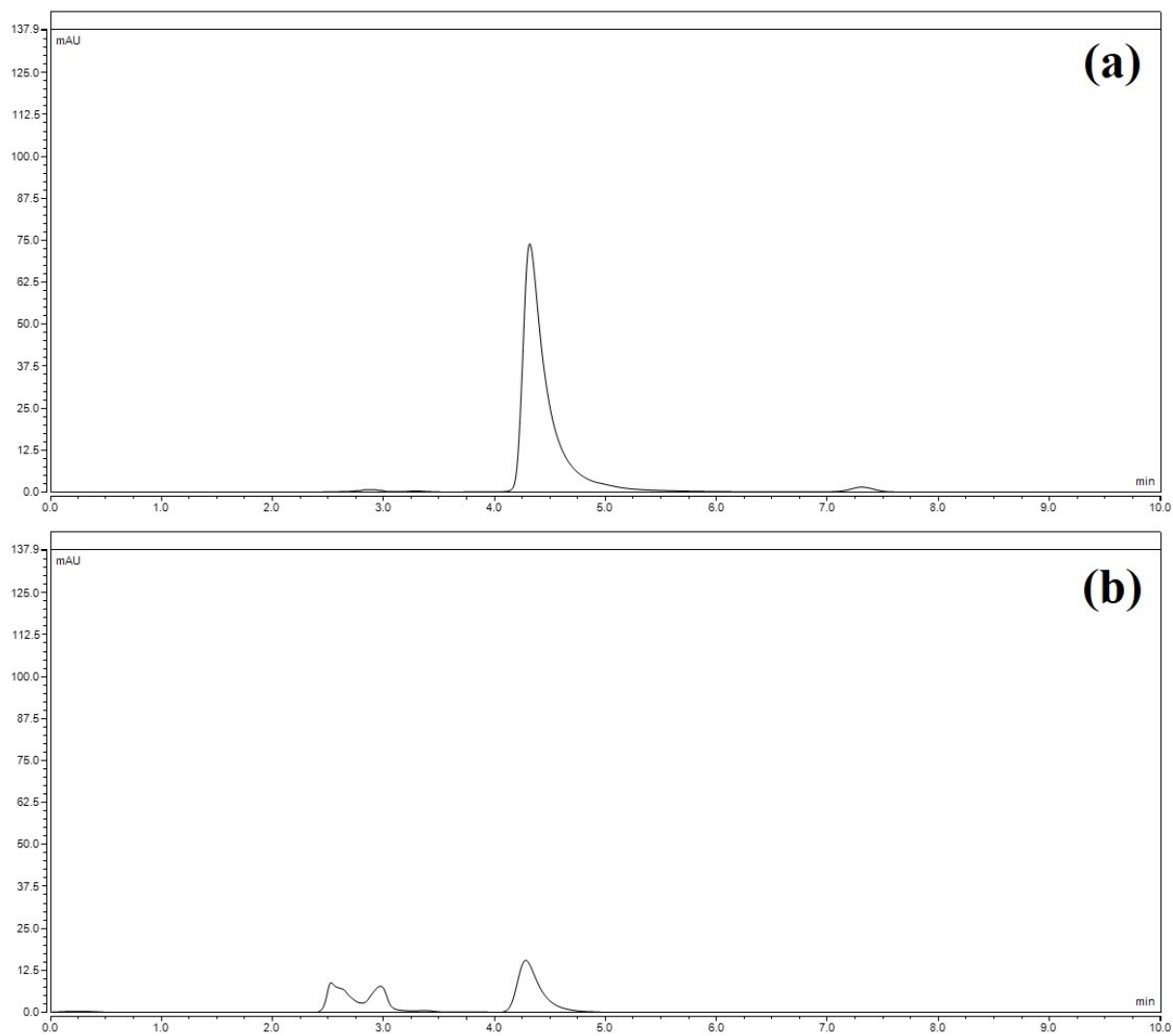


Fig. S14. HPLC chromatogram of TA in 1-propanol at (a) 0 h and (b) after 96 h irradiation.

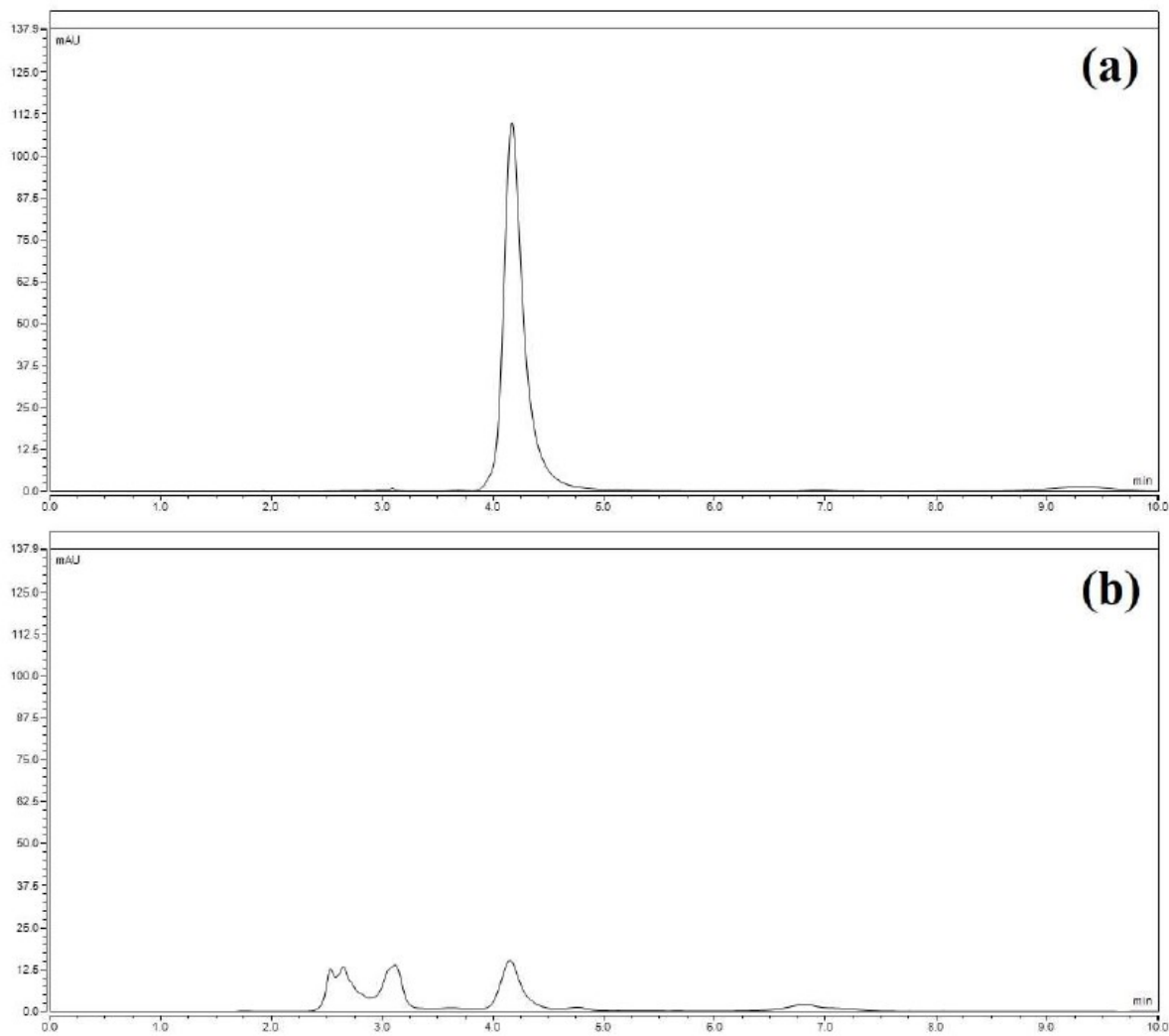


Fig. S15. HPLC chromatogram of TA in 1-butanol at (a) 0 h and (b) after 96 h irradiation.

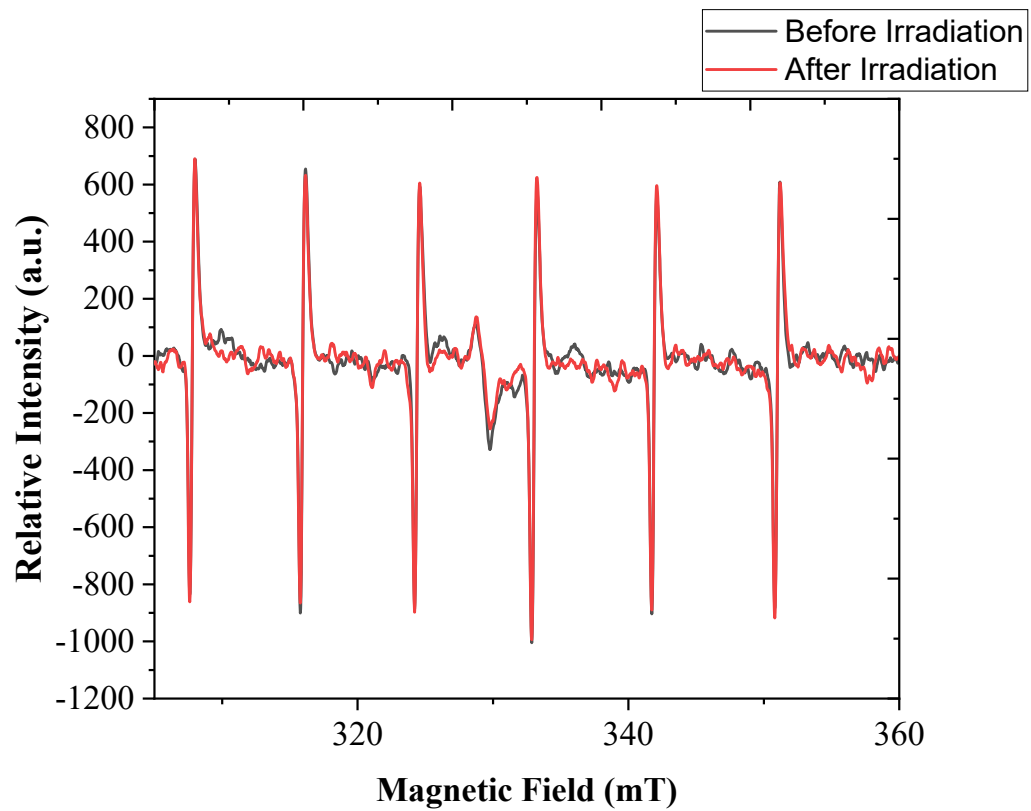


Fig. S16. ESR spectra of TA in acetonitrile at room temperature before and after irradiation.

Table S1. Photodegradation of TA in the acidic region (2.0–6.0)

Time (min)	pH				
	2.0	3.0	4.0	5.0	6.0
Concentration ($M \times 10^5$)					
0	5.00	5.00	5.00	5.00	5.00
30	1.41	0.56	1.20	2.82	3.55
60	0.45	0.10	0.51	1.12	1.86
90	0.11	0.01	0.10	0.45	1.26
120	0.03	–	0.05	0.22	0.83
150	–	–	–	0.07	0.60
180	–	–	–	–	0.32

Table S2. Photodegradation of TA in the alkaline region (7.0–12.0)

Time (min)	pH					
	7.0	8.0	9.0	10.0	11.0	12.0
Concentration ($M \times 10^5$)						
0	5.00	5.00	5.00	5.00	5.00	5.00
30	3.80	3.72	3.80	4.07	4.07	4.17
60	2.82	2.88	2.95	3.24	3.39	3.47
90	2.04	2.09	2.19	2.57	2.63	2.82
120	1.48	1.55	1.66	2.04	2.09	2.29
150	1.02	1.10	1.25	1.62	1.74	1.86
180	0.74	0.81	0.98	1.23	1.41	1.55

Table S3. The photolysis of TA in various organic solvents (2.0×10^4 M)

Time (min)	TA Concentration in Solvents ($M \times 10^4$)				
	Acetonitrile	Methanol	Ethanol	1-Propanol	1-Butanol
0	2.00	2.00	2.00	2.00	2.00
360	1.44	1.50	1.62	1.72	1.83
1440	0.81	0.89	0.98	1.15	1.35
1800	0.65	0.73	0.81	1.00	1.18
2880	0.31	0.37	0.47	0.66	0.79
3240	0.21	0.27	0.36	0.55	0.67
4320	0.09	0.13	0.17	0.29	0.37
4680	0.06	0.10	0.14	0.23	0.30
5760	0.02	0.05	0.07	0.14	0.20

Table S4. The photolysis of double-strength TA solution (4.0×10^4 M) in various organic solvents

Time (min)	TA Concentration in Solvents ($M \times 10^4$)				
	Acetonitrile	Methanol	Ethanol	1-Propanol	1-Butanol
0	4.00	4.00	4.00	4.00	4.00
360	3.14	3.27	3.35	3.64	3.81
1440	1.93	2.09	2.21	2.68	3.05
1800	1.65	1.76	1.92	2.37	2.76
2880	0.86	1.00	1.16	1.56	1.92
3240	0.68	0.83	0.99	1.29	1.68
4320	0.33	0.43	0.55	0.72	1.07
4680	0.25	0.34	0.42	0.60	0.91
5760	0.09	0.15	0.27	0.41	0.66