Electronic Supplementary Information

Inhibitory Effects of Natural Organic Matter on Methyltriclosan Photolysis Kinetics

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Analytic methods:

FFA was analyzed by high performance liquid chromatography (HPLC, 1260, Agilent, USA) with a photo-diode array detector and XDB-C_{18} column (5 μm, 150 mm × 4.6 mm). The mobile phase was CH_3CN/H_2O = 20/80 with a flow rate of 0.8 $mL \cdot min^{-1}$ and detector wavelength of 218 nm.

MTCS was determined by gas chromatography-mass spectrometry (Agilent GS-MS 7890-5977, Wilmington, DE, USA). A HP-5MS capillary column (30 m × 0.32 mm I.D., 0.25 μm film thickness, Agilent) was employed for the separation and analysis of

MTCS. Sample injections were performed in splitless mode using an injection temperature of 260 ^{o}C. The oven temperature was initially at 80 ^{o}C and held for 2 min, increased to 200 ^{o}C at 20 ^{o}C•min^{-1} and held for 1 min, then the temperature was raised to 230 ^{o}C at 5 ^{o}C•min^{-1}, which was held for 1 min, followed by an increase of 20 ^{o}C min^{-1} to 280 ^{o}C and holding for 1 min. Helium (>99.99%) was employed as the carrier gas at a constant flow rate of 1.0 mL•min^{-1}, and the split flow was set at 60 mL•min^{-1} for make-up gas. The MS was operated in scan mode for optimization studies and in selected ion monitoring (SIM) mode for calibration and analyte quantification in real samples. Fig. S1 shows the total ion chromatogram (TIC) and mass spectrum (MS) profile of MTCS (40 μg/L) in the working solution, suggesting that the typical molecular weight of MTCS is 302 *m/z* and the main fragment peak is 252 *m/z*. Electron ionization at 70 eV was used. A solvent delay of 4.5 min was established. The *m/z* range in the scan mode was 50-350 amu. The ion source and the quadrupole temperatures were set at 300 and 150 ^{o}C, respectively.

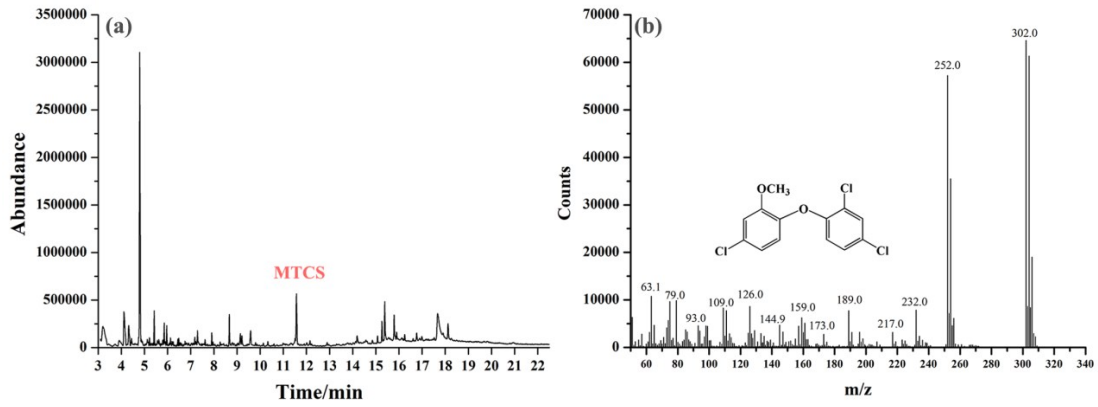


Figure S1. (a) Total ion chromatogram (TIC) for the MTCS (40 μg/L) working solution; (b) The mass spectrum of MTCS (40 μg/L) in the working solution.

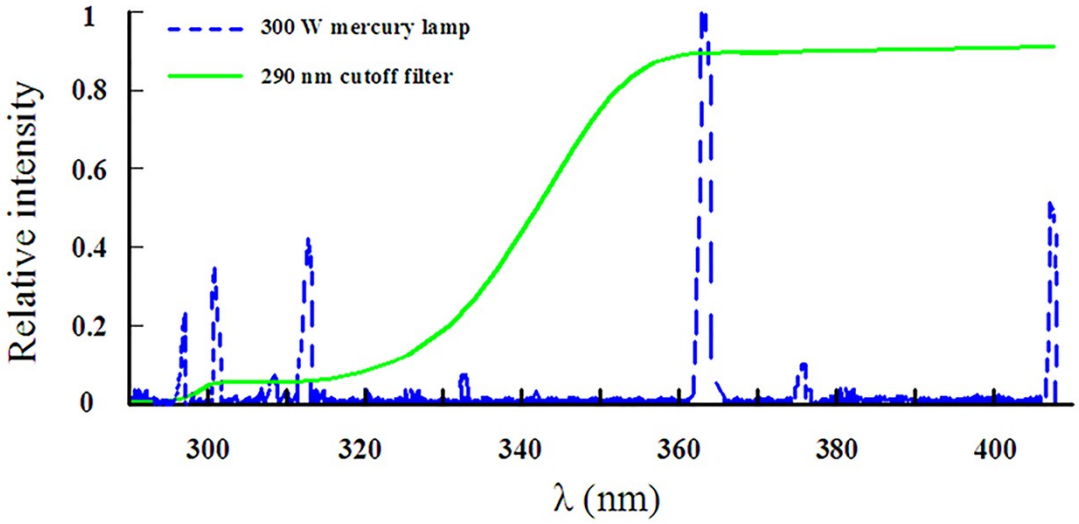


Figure S2. Relative irradiance of 300 W mercury lamp and transmittance of the 290 nm cutoff filter.

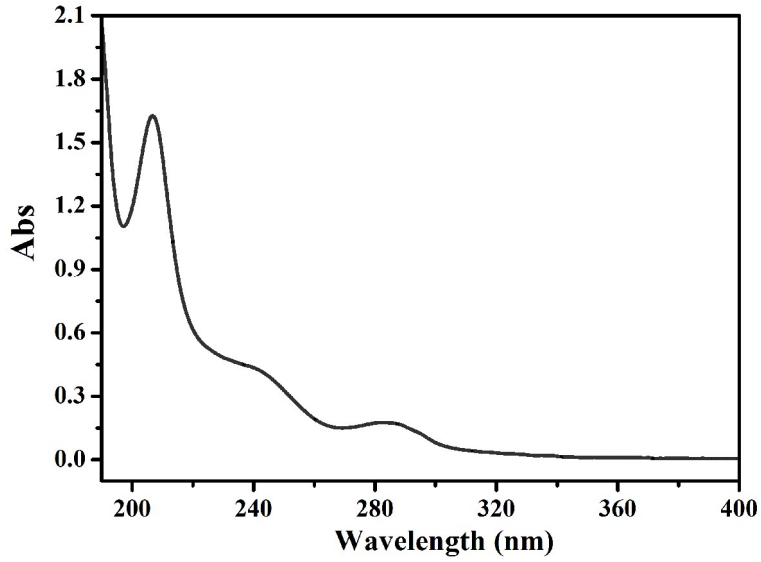


Figure S3. The UV-visible absorption spectrum of (40 μg/L) MTCS in water.

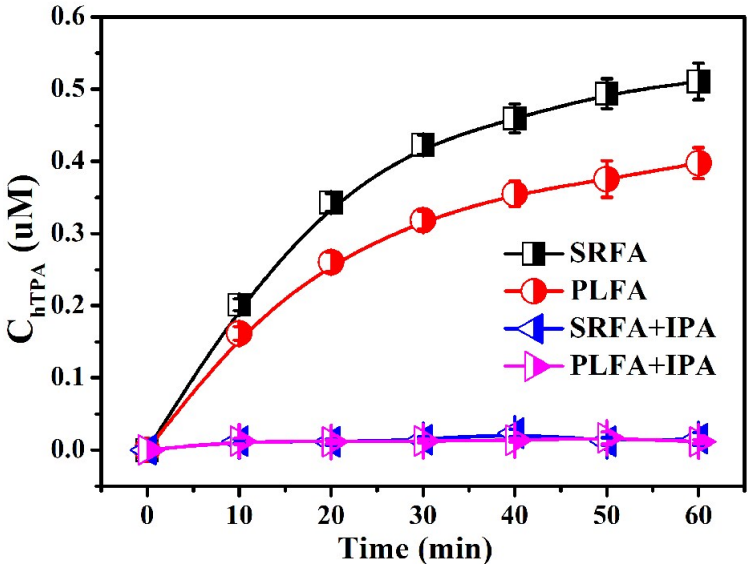


Figure S4. hTPA concentrations detected in photolysis process. The concentrations of TPA, SRFA, PLFA and IPA were 500 μmol•L^{-1}, 20 mg•L^{-1}, 20 mg•L^{-1} and 100 mmol•L^{-1}, respectively.

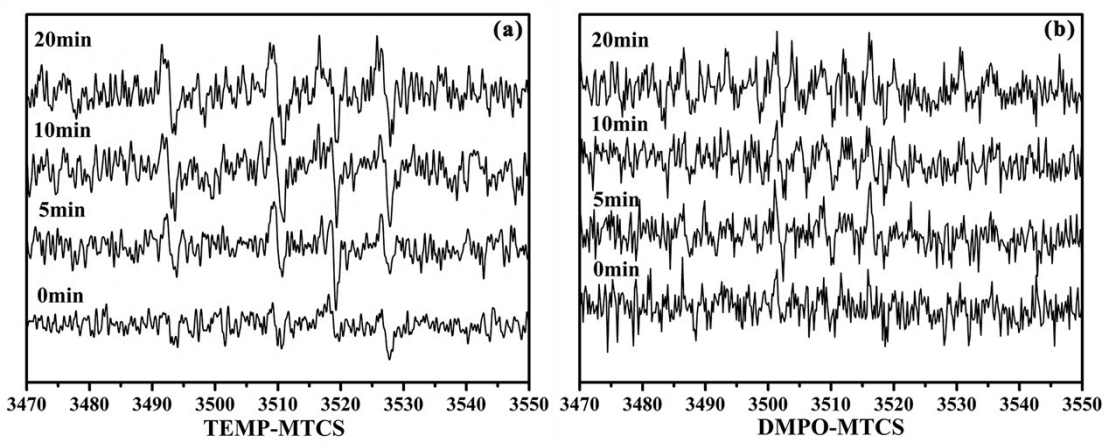
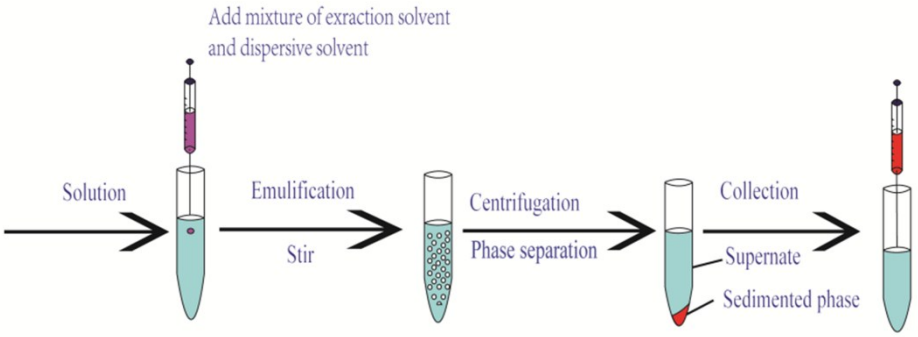


Figure S5. EPR spectra in (40 μg/L) MTCS photolysis system without PLFA and SRFA. (a) $^1O_2$ spin-trapping with TEMP, (b) •OH spin-trapping with DMPO.



Scheme S1. Dispersive liquid-liquid microextraction (DLLME) procedure.

Table S1. Apparent-first-order kinetic rate constants for MTCS photodegradation in different systems.

Reactions*	k ($\times 10^{-3}$) min^{-1}	R^2
Water	6.81 ± 0.20	0.996
PLFA	2.71 ± 0.12	0.996
SRFA	1.62 ± 0.02	0.999

*PLFA is Pony Lake fulvic acid (microbial origin, 20 mg•L^{-1}) and SRFA is Suwannee River fulvic acid (terrestrial origin, 20 mg•L^{-1}).

Table S2. Apparent-first-order kinetic rate constants for MTCS photodegradation in different systems for initial NOM concentrations from 0 to 25 mg•L^{-1}.

C (mg•L^{-1})	***k***/PLFA* (×10^{-3} min^{-1})	***k***/SRFA* (×10^{-3} min^{-1})
0	6.81 ± 0.20	6.81 ± 0.20
5	6.13 ± 0.26	5.20 ± 0.20
10	4.34 ± 0.23	4.25 ± 0.14
15	3.35 ± 0.15	3.14 ± 0.09
20	2.71 ± 0.12	1.62 ± 0.02
25	1.40 ± 0.09	1.00 ± 0.02

*PLFA is Pony Lake fulvic acid (microbial origin) and SRFA is Suwannee River fulvic acid (terrestrial origin).

Table S3. Apparent-first-order kinetic rate constants for MTCS photodegradation in the presence of PLFA and SRFA with nitrogen saturation (anaerobic) and sorbic acid.

Reactions	*k*/SRFA* ($\times 10^{-3}$)	*k*/PLFA* ($\times 10^{-3}$)
N_2	3.44 ± 0.03	4.12 ± 0.11
SA	0.61± 0.01	1.24 ± 0.05

*PLFA is Pony Lake fulvic acid (microbial origin, 20 mg•L^{-1}) and SRFA is Suwannee River fulvic acid (terrestrial origin, 20 mg•L^{-1}).