**Indirect photodegradation of ofloxacin in simulated seawater: important roles of DOM and environmental factors**

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**Table S1**

Optimized parameters of HPLC

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Compounds | Mobile phase composition (v: v) | Detectionwavelength(nm) | Flow rate(mL/min) | Injectionvolume(μL) |
| OFX | Acetonitrile: 0.1% H3PO4(40.:60) | 290 nm | 1.0  | 20.0  |
| FFA | Acetonitrile: 0.08% H3PO4(10:90) | 216 nm | 1.0  | 20.0  |
| TA | Methanol: 0.08% H3PO4(50:50) | 254 nm | 1.0  | 20.0  |
| HOTA | Methanol: 0.08% H3PO4(50:50) | λex=315 nmλem=425 nm | 1.0  | 20.0  |
| SA | Sodium acetate buffer (pH 4.75): Acetonitrile(85:15) | 254 nm | 1.0  | 20.0  |

**Table S2**

The proportion of indirect photodegradation in DOM solutions (10 mg C L-1)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | concentration(mg C L-1) | *f* | *k*obs | k(non-DOM)\*ƒ | *k*ind | IP% |
| SRHA | 2 | 0.901  | 0.012  | 0.009  | 0.004  | 0.305  |
|  | 5 | 0.770  | 0.022  | 0.007  | 0.015  | 0.668  |
|  | 10 | 0.522  | 0.025  | 0.005  | 0.020  | 0.801  |
| SRFA | 2 | 0.924  | 0.014  | 0.009  | 0.005  | 0.356  |
|  | 5 | 0.842  | 0.014  | 0.008  | 0.006  | 0.429  |
|  | 10 | 0.624  | 0.016  | 0.006  | 0.010  | 0.627  |
| JKHA | 2 | 0.754  | 0.015  | 0.007  | 0.008  | 0.525  |
|  | 5 | 0.526  | 0.037  | 0.005  | 0.032  | 0.865  |
| 　 | 10 | 0.292  | 0.060  | 0.003  | 0.058  | 0.954  |

**Table S3**

The contribution rate of RIs on indirect photodegradation of OFX

|  |  |  |  |
| --- | --- | --- | --- |
| RIs | 1O2 | ∙OH | 3DOM\* |
| OFX | 34.7% | 11.5% | 44.8% |

**Table S4**

Characteristics of the four components identified in the present study compared with those previously identified.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Ex/Em/nm | Description and probable source | Comparison withother studies |
| C1 | 420/500 |  terrestrial humic-like materials | (Yamashita et al., 2015) (Cawley et al., 2012) |
| C2 | 370/460 | terrestrial humic-like materials | (Zhang et al., 2009) |
| C3 | 460/520 | soil fulvic acid  | (Lochmueller and Saavedra, 1986) |
| C4 | 320/440 | visible humic-like  | (Chen et al., 2017) (Coble et al., 1998) |

**Table S5**

The fluorescence intensities of PARAFAC-identified components.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| DOM | Concentration (mg C/L) | C1 fluorescence intensity (QSU) | 　 | C2 fluorescence intensity (QSU) | 　 | C3 fluorescence intensity (QSU) | 　 | C4 fluorescence intensity (QSU) | 　 | Total fluorescence intensity (QSU) | 　 | HIX | 　 | SUVA254 |
|  |  | before | after |  | before | after |  | before | after |  | before | after |  | before | after |  |
| SAHA | 2 | 0.50  | 0.44  |  | 0.69  | 0.64  |  | 0.37  | 0.34  |  | 0.45  | 0.67  |  | 2.01  | 2.09  |  | 8.45  |  | 6.73  |
|  | 5 | 1.12  | 0.86  |  | 1.49  | 1.27  |  | 0.85  | 0.64  |  | 0.83  | 1.03  |  | 4.29  | 3.80  |  | 14.09  |  | 6.86  |
|  | 10 | 2.12  | 1.45  |  | 2.65  | 2.23  |  | 1.62  | 0.97  |  | 1.17  | 1.46  |  | 7.56  | 6.11  |  | 23.94  |  | 10.70  |
| SRFA | 2 | 0.74  | 0.40  |  | 1.50  | 0.74  |  | 0.31  | 0.26  |  | 1.06  | 0.80  |  | 3.60  | 2.20  |  | 9.64  |  | 5.63  |
|  | 5 | 1.47  | 0.73  |  | 2.80  | 1.36  |  | 0.67  | 0.44  |  | 1.85  | 1.33  |  | 6.80  | 3.87  |  | 17.72  |  | 5.50  |
|  | 10 | 2.74  | 1.30  |  | 4.97  | 2.51  |  | 1.30  | 0.75  |  | 2.88  | 2.08  |  | 11.89  | 6.64  |  | 27.18  |  | 9.40  |
| JKHA | 2 | 3.38  | 2.12  |  | 2.34  | 1.33  |  | 3.57  | 2.23  |  | 1.92  | 2.13  |  | 11.21  | 7.81  |  | 22.06  |  | 14.56  |
|  | 5 | 6.81  | 4.21  |  | 4.71  | 2.82  |  | 7.24  | 3.85  |  | 3.53  | 3.53  |  | 22.28  | 14.41  |  | 49.94  |  | 14.39  |
| 　 | 10 | 10.99  | 8.13  | 　 | 7.53  | 5.28  | 　 | 11.96  | 8.14  | 　 | 5.02  | 4.26  | 　 | 35.50  | 25.81  | 　 | 96.12  | 　 | 18.09  |

**Table S6**

Steady-state concentrations of ∙OH, 1O2, and 3DOM\* in different DOM solutions.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Type of DOM | DOC (mg C/L) | [∙OH]ss (10-17 M) | [1O2]ss (10-13 M) |  | [3DOM\*]ss (10-14 M) |
| SRHA | 2 | 0.66±0.03 | 0.97±0.05 |  | 0.46±0.02 |
|  | 5 | 1.01±0.02 | 1.60±0.03 |  | 0.98±0.01 |
|  | 10 | 1.49±0.04 | 3.2±0.03 |  | 1.57±0.01 |
| SAFA | 2 | 0.54±0.02 | 0.95±0.03 |  | 0.52±0.01 |
|  | 5 | 0.97±0.01 | 1.56±0.03 |  | 1.02±0.01 |
|  | 10 | 1.47±0.02 | 2.44±0.04 |  | 1.86±0.02 |
| JKHA | 2 | 3.08±0.11 | 1.60±0.08 |  | 2.42±0.01 |
|  | 5 | 5.87±0.17 | 2.37±0.11 |  | 4.89±0.01 |
|  | 10 | 7.56±0.23 | 4.42±0.18 |  | 6.78±0.03 |



b

a

**Figure. S1.** (a)The concentrations of OFX under light and dark conditions; (b) UV–Vis absorption spectra of OFX



**Figure. S2.** RDA of fluorescence components, FI, HIX, SUVA254 and HIX with RIs, *kind*.