Supporting Information for

Evolution of soil DOM during thermal remediation below 100°C: concentration, spectral characteristics and complexation ability

Running title: Properties and complexation ability of soil DOM during thermal remediation

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This SI file contains 8 figures and 2 tables.

The fluorescence regional integration (FRI) method was adopted for quantitative analysis of EEM results. The EEM spectra was divided into five regions, which represented five kinds of substances (Table S1). Regional integrated fluorescence intensity was calculated by Eq(S1) (He et al., 2011; Wei et al., 2014).

$$V_i = \sum_{ex}\sum_{em} I\,(\lambda_{ex}\,\lambda_{em})\,\mathrm{d}\lambda_{ex}\,\mathrm{d}\lambda_{em} \qquad (S1)$$

where V_i is the integrated fluorescence volume of region i, $I\,(\lambda_{ex}\lambda_{em})$ indicates the fluorescence intensity at excitation wavelength of λ_{ex} and emission wavelength of λ_{em}. The $\mathrm{d}\lambda_{ex}$ and $\mathrm{d}\lambda_{em}$ are the intervals of excitation and emission wavelength, which are 5 nm in this study.

Table S1 EEM boundaries and categories of the five fluorescence regions

	Ex (nm)	**Em (nm)**	**Categories**
Rigion I	200-250	280-325	Tyrosine-like substances
Rigion II	200-250	325-375	Tryptophan-like substances
Rigion III	200-250	375-550	Fulvic acid-like substances
Rigion IV	250-450	280-375	Protein-like substances
Rigion V	250-450	375-550	Humic acid-like substances

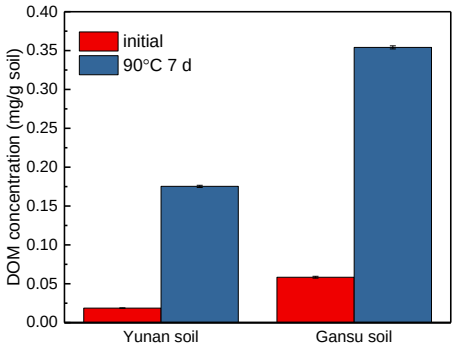

Fig. S1. The concentration of Yunan soil DOM and Gansu soil DOM during thermal treatment at 90°C.

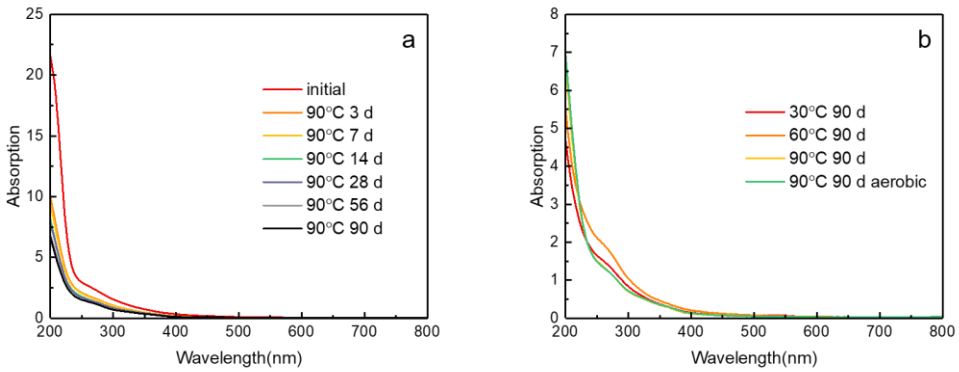

Fig. S2. The UV spectra of soil DOM: (a) 90°C incubation at different heating time, (b) 90-d incubation at different heating conditions.

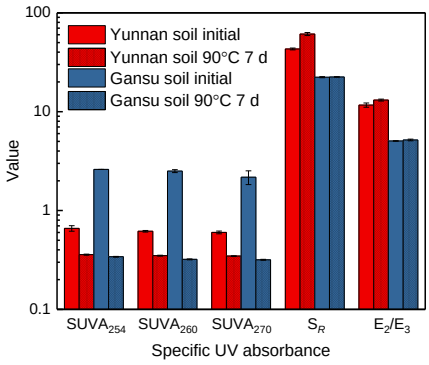

Fig. S3. The specific UV absorbance value of Yunan soil DOM and Gansu soil DOM during thermal treatment at 90°C.

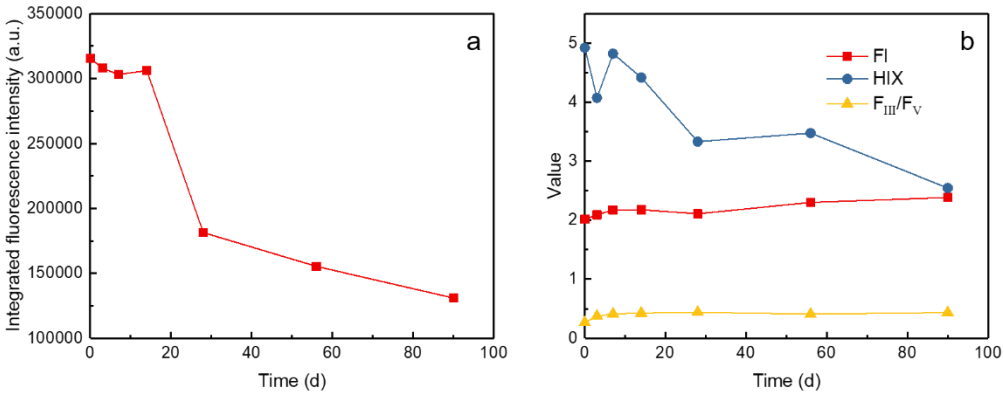

Fig. S4. The integrated fluorescence intensity (a) and fluorescence index (b) of soil DOM EEM at 90°C during the thermal treatment.

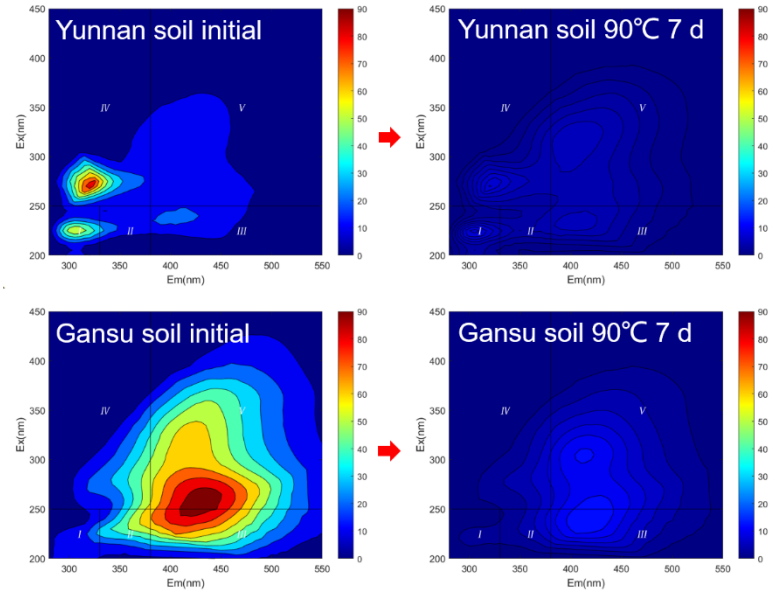

Fig. S5. The fluorescence EEM of Yunan soil DOM and Gansu soil DOM during thermal treatment at 90°C.

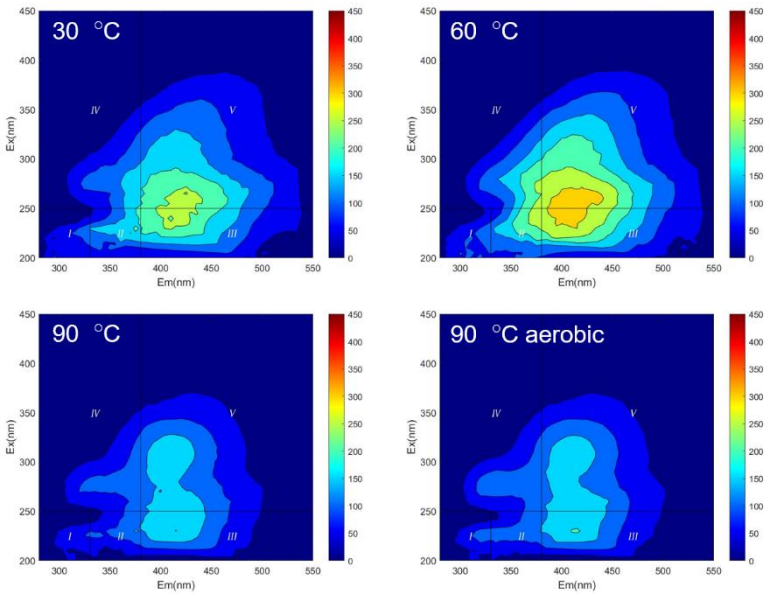

Fig. S6. The fluorescence EEM of soil DOM at different heating conditions at 90 d.

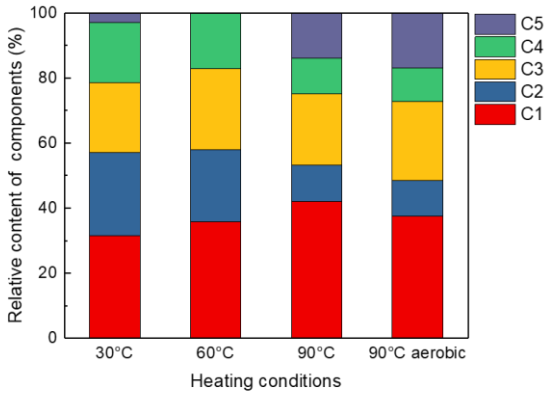

Fig. S7. The relative content of the EEM-PARAFAC components of the soil DOM at different heating conditions at 90 d.

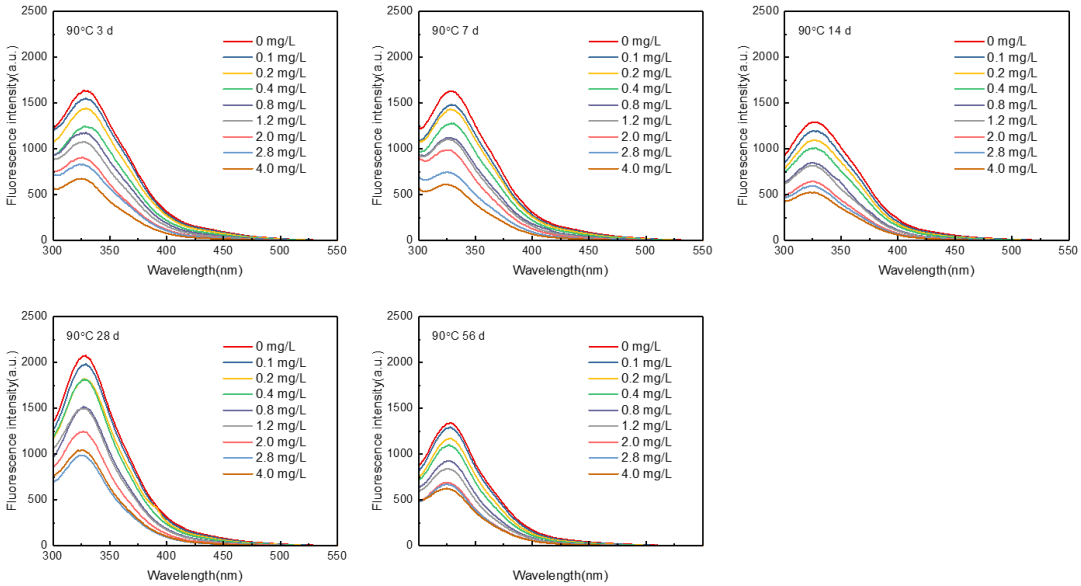

Fig. S8. The fluorescence quenching spectra of the soil DOM at 90°C (3 d, 7 d, 14 d, 28 d, 56 d).

Table S2 Complexation balance constant and complexation number of soil DOM at different heating time during the 90°C thermal treatment

Heating Time (d)	**L*gk***	***n***	***R*²**
0	4.93	1.06	0.923
3	3.52	0.81	0.974
7	3.21	0.74	0.975
14	3.40	0.77	0.989
28	3.48	0.82	0.963
56	3.16	0.73	0.979
90	3.03	0.71	0.994

References

He X-S, Xi B-D, Wei Z-M, Jiang Y-H, Yang Y, An D, Cao J-L, Liu H-L (2011). Fluorescence excitation–emission matrix spectroscopy with regional integration analysis for characterizing composition and transformation of dissolved organic matter in landfill leachates. Journal of Hazardous Materials, 190(1-3): 293-299

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