

Supporting Information for

“Seasonal changes in Fe species and soluble Fe concentration in the atmosphere in the Northwest Pacific region based on the analysis of aerosols collected in Tsukuba, Japan”

by Yoshio Takahashi, Takema Furukawa, Yutaka Kanai,
Mitsuo Uematsu, Guodong Zheng, and Matthew A. Marcus

Table S1. Concentrations of major anions in aerosol collected at Tsukuba.

month	chloride $\mu\text{g}/\text{m}^3$	nitrate $\mu\text{g}/\text{m}^3$	sulfate $\mu\text{g}/\text{m}^3$	oxalate ng/m^3
December	2.33	3.44	2.56	129
February	2.56	4.27	4.87	219
March	1.55	9.08	7.22	338
May	1.33	5.21	8.68	508
June	1.06	7.71	8.60	423
July	1.54	5.52	8.77	441
August	0.385	2.06	4.12	209
September	1.51	2.24	3.42	88.7
October	2.13	3.27	2.99	189

Table S2. Concentrations of total Fe and Fe soluble in Milli-Q (MQ) water and simulated seawater (SW) noted as [FeMQ] and [FeSW], respectively.

month	[Fe _{Total}] ng/m ³	[Fe _{MQ}] ng/m ³	[Fe _{SW}] ng/m ³
December	478	6.84	52.6
February	574	16.8	72.7
March	970	32.3	107
May	916	95.3	192
June	909	76.1	201
July	514	86.1	175
August	208	27.3	64.7
September	241	12.6	45.1
October	457	15.6	65.3

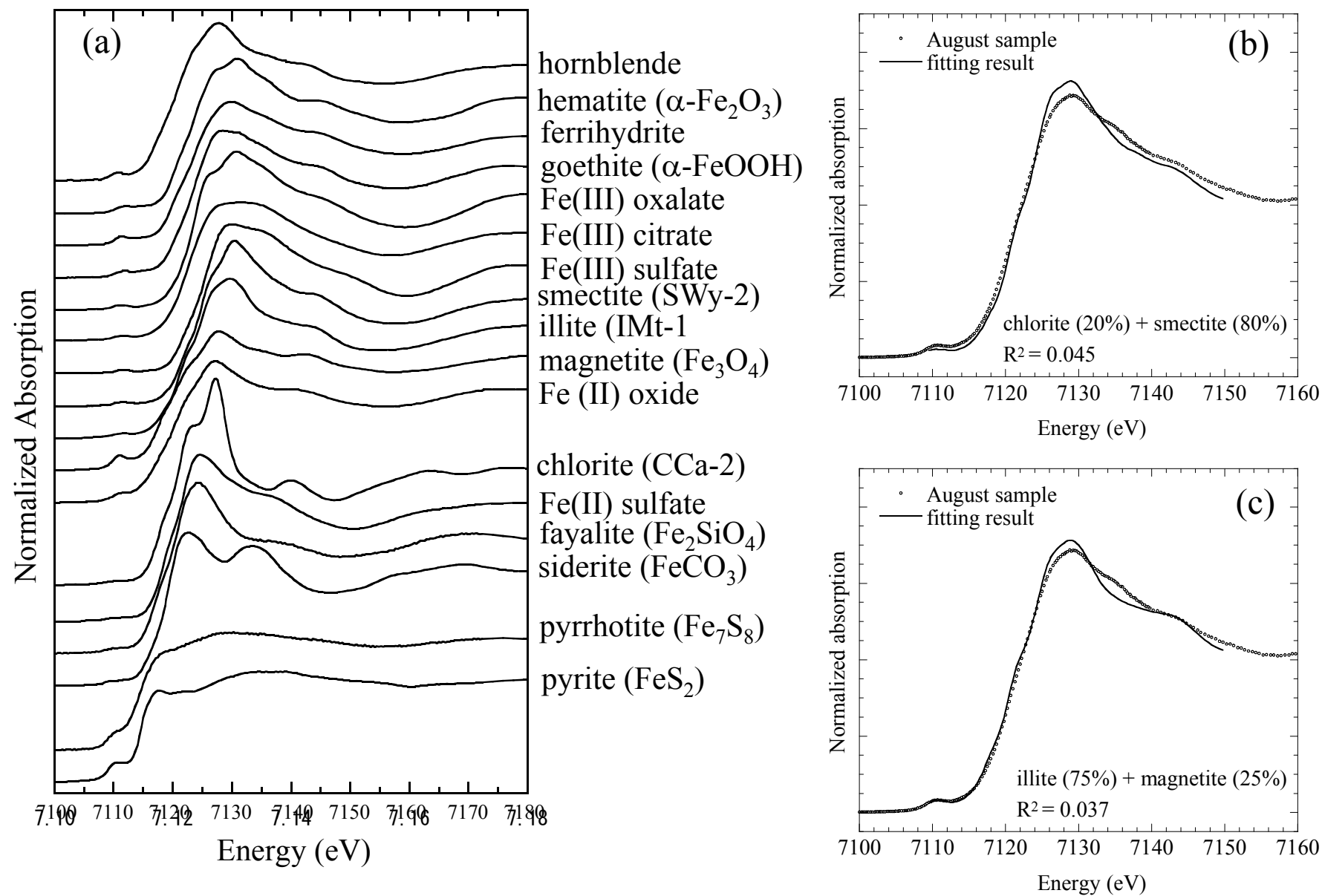


Figure S1. (a) Iron K-edge XANES for various reference materials. Fitting results of the spectrum of August sample by the LCF of (b) chlorite and smectite and (c) illite and magnetite are also shown.

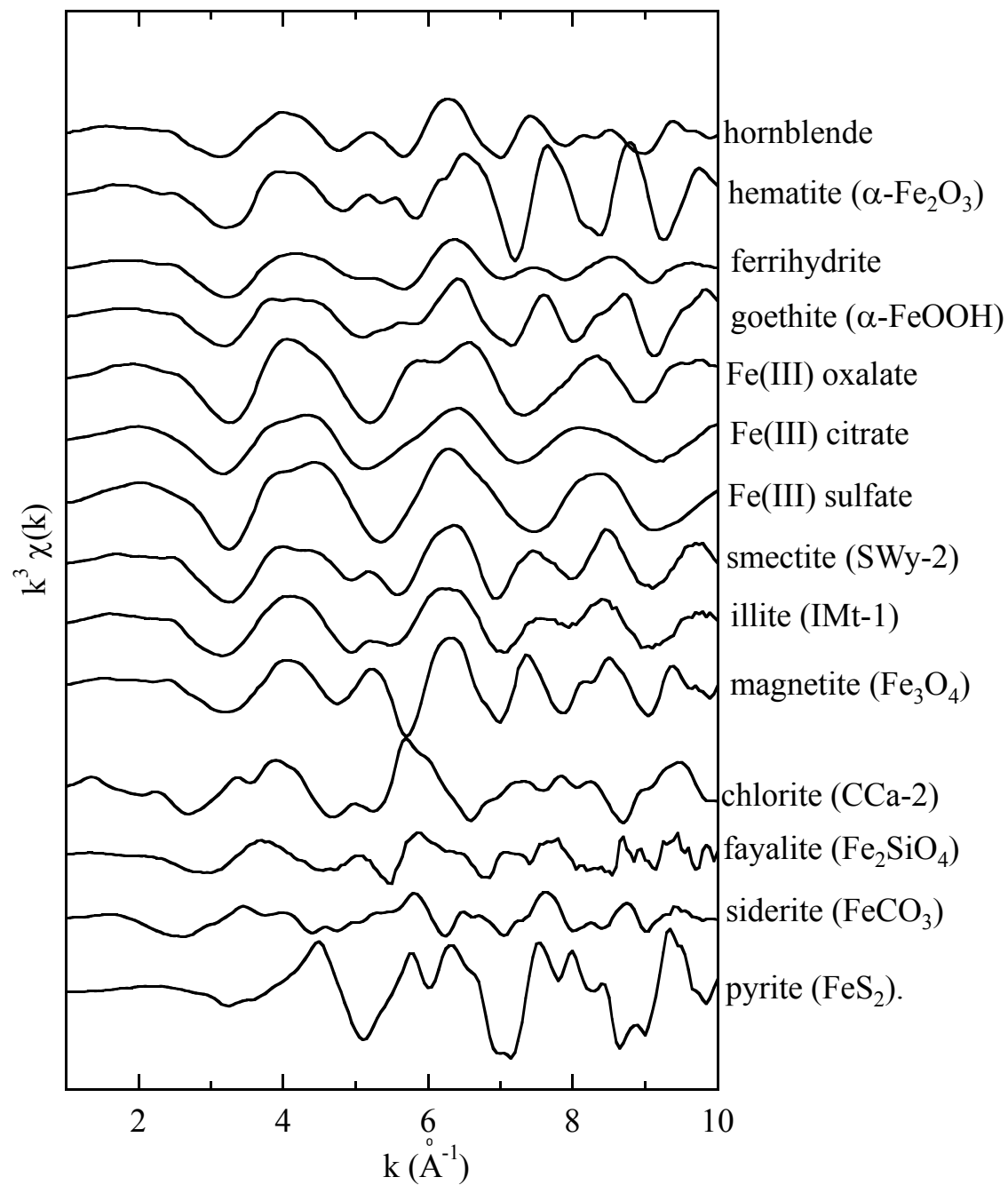
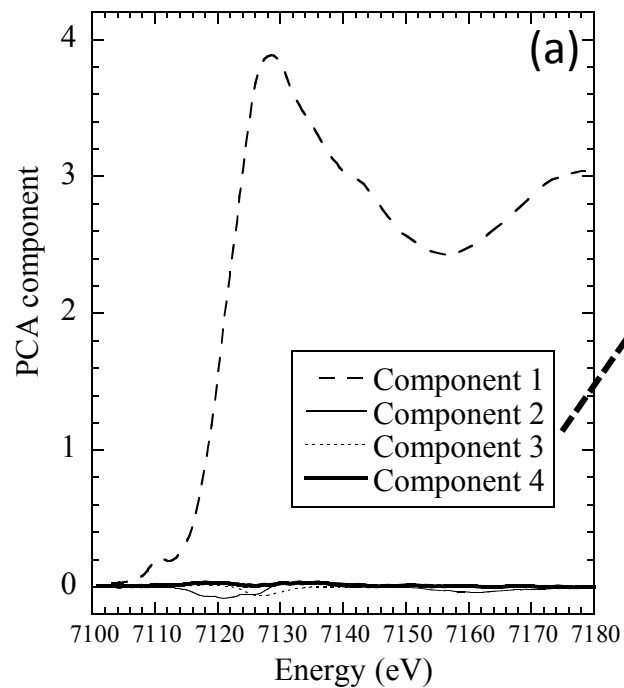


Figure S2. Iron K-edge EXAFS spectra of various reference materials.



Component	Eigenvalues	Variance	Cumulative variance
1	8.995467	0.999496	0.999496
2	0.003051	0.000339	0.999835
3	0.000950	0.000106	0.999941
4	0.000407	0.000045	0.999986

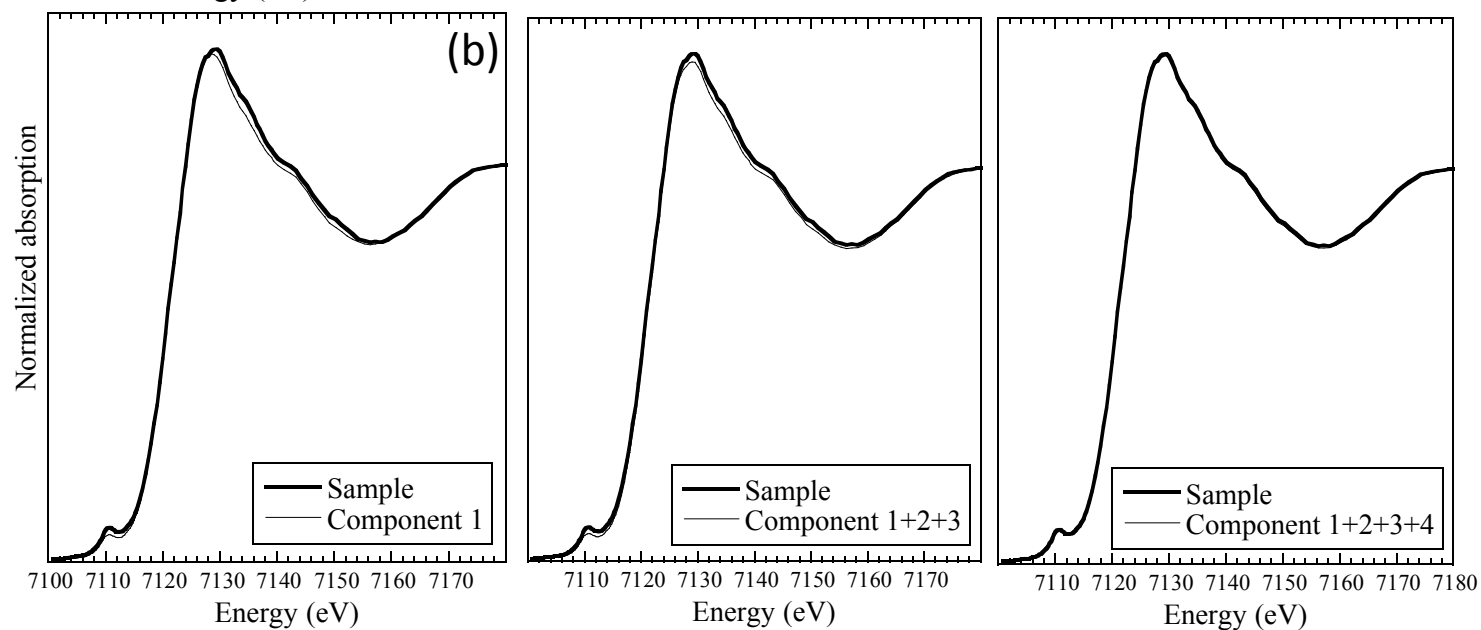


Figure S3. (a) Results of PCA analysis for Fe K-edge XANES for various months and (b) fitting of the spectrum in July by component 1, component 1+2+3, and component 1+2+3+4.

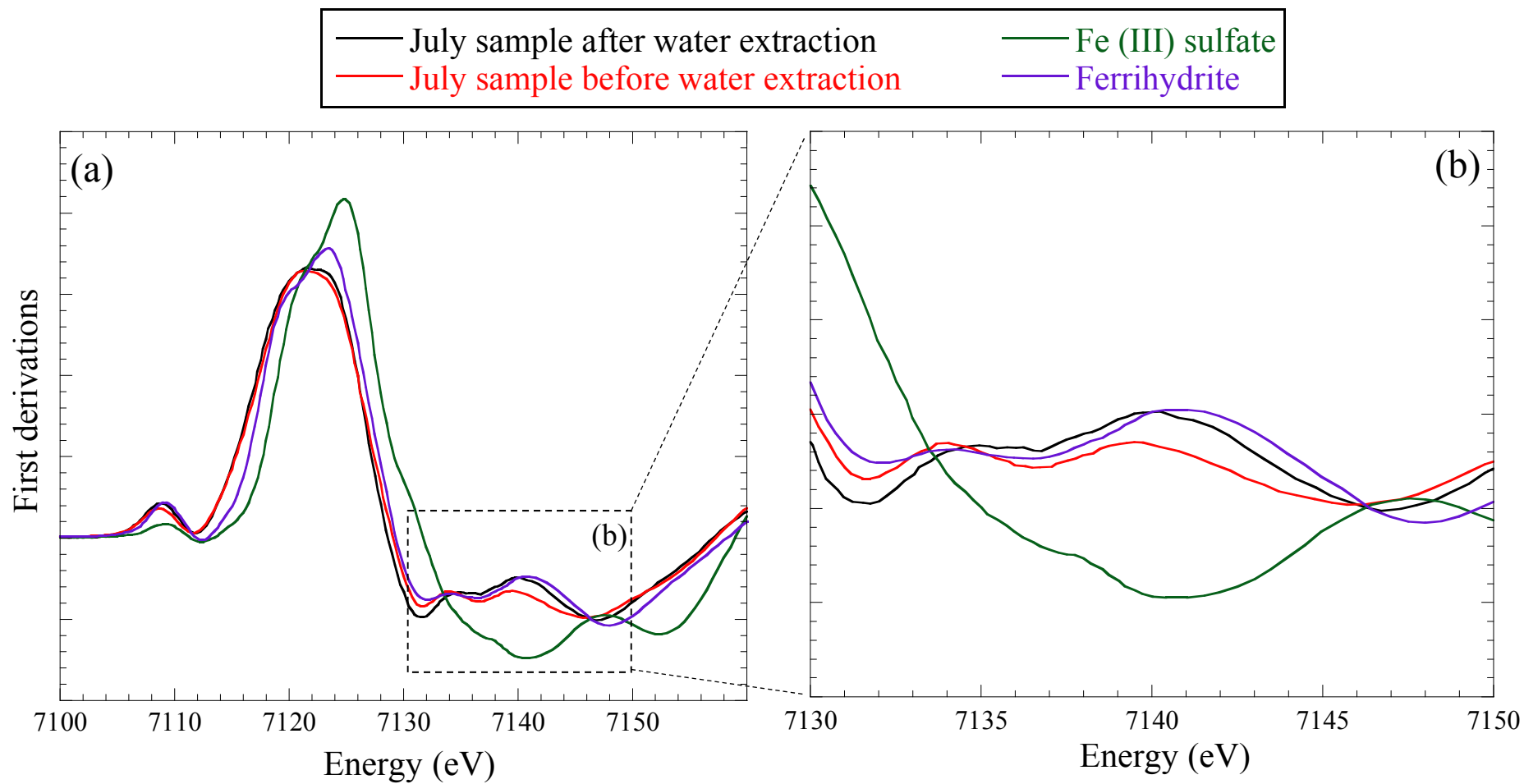


Figure S4. Variation of first derivative spectra of the sample in July before and after the water extraction treatment . Spectra of Fe(III) sulfate and ferrihydrite are also shown.

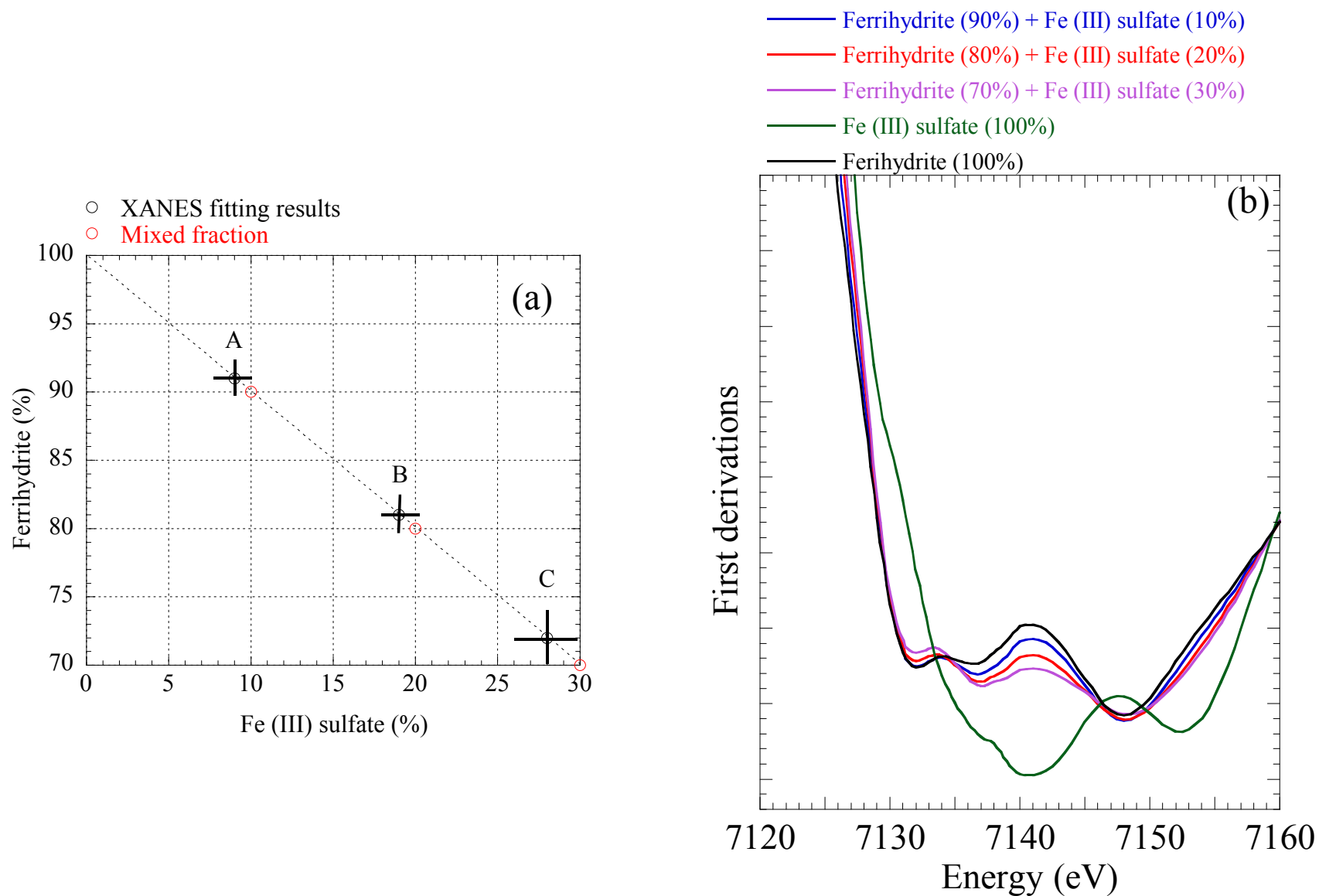


Figure S5. Variation of XANES spectra and first derivative spectra for the mixtures of ferrihydrate and Fe(III) sulfate with their calculated fractions determined by the LCF of the spectra to explain the variation of the spectra in Fig. S3. (a) Comparison of fitting results with the mixing ratio to prepare the samples; (b) variation of the first derivative spectra.

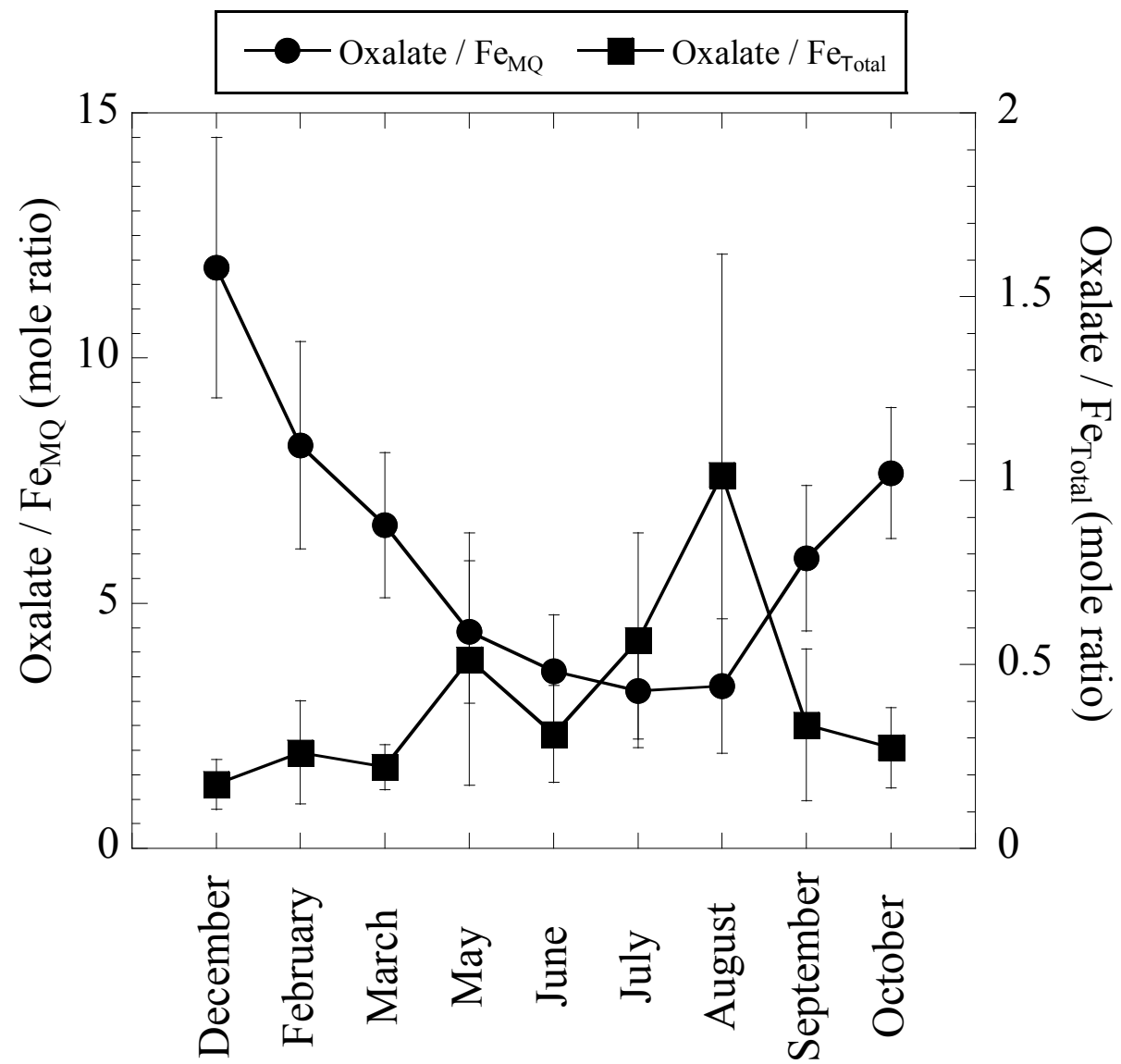


Figure S6. Oxalate/Fe_{MQ} and oxalate/Fe_{Total} ratios in various months.