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SUPPLEMENTARY INFORMATION

Effects of supplemental organic carbon on long-term reduction and reoxidation of uranium

Fubo Luan[1]*, Gengxin Zhang[2], John M. Senko[3], and William D. Burgos[1]*

[1]Department of Civil and Environmental Engineering, The Pennsylvania State University, University Park, PA 16802-1408; [2]Institute of Tibetan Research, Chinese Academy of Sciences, Beijing, China; [3]Department of Geosciences and Department of Biology, The University of Akron, Akron, OH

*Corresponding author: Fubo Luan, Dept. of Civil and Environmental Engineering, The Pennsylvania State University, 212 Sackett Building, University Park, PA, 16802
phone: 814-863-0578; fax: 814-863-7304. Email: ful6@psu.edu.

William D. Burgos, Dept. of Civil and Environmental Engineering, The Pennsylvania State University, 212 Sackett Building, University Park, PA, 16802
phone: 814-863-0578; fax: 814-863-7304. Email: wdb3@psu.edu.

Contents

Calculation of the average column pore volume (PV)

The column is 25 mm diameter and the length of the sediments is 100 mm. The porosity of the sediments is 40%. Therefore, the average column pore volume (PV)= $\pi \times r^2 \times$ length of the sediments $\times$ porosity=$3.14 \times (25/2)^2 \times 100 \times 40\% = 19625\ mm^3$= 20 ml

DNA Isolation, Amplification, Cloning and Sequencing

Total DNA was extracted from core sediments using the UltraClean Soil DNA Isolation Kit (Mo Bio Laboratory Inc., Solana Beach, CA). Bacterial 16S rRNA genes were amplified by polymerase chain reaction (PCR) using the manufacturer's recommended procedures for the Failsafe Kit (Epicentre Biotechnologies, Madison, WI). PCR reaction mixtures contained 10 mM Tris (pH 8.3), 50 mM KCl, 1.5 mM $MgCl_2$, 200 μM each dNTP, 0.2 μM each primer, and 1.25 unit FailSafe PCR Enzyme Mix in 50 μL reaction volume. Bacterial primer sequences were Bac27F: 5′-AGAGTTTGATCMTGGCTCAG, and Univ1492R: 5′-CGGTTACCTTGTTACGACTT. The following standard conditions were used for PCR: 30 cycles (denaturing at 95 ^oC for 30 sec, annealing at 57 ^oC for 30 sec, extension at 72 ^oC for 1.5 min). PCR products were ligated into pGEM®-T vector (Promega Inc., Madison, WI) and transformed into competent *Escherichia coli* DH5α. Clone libraries were constructed, and plasmid DNA was purified from clones using a Qiagen kit (Qiagen Inc., Chatsworth, CA). Bacterial 16S rRNA genes were sequenced from Bac27F primer with a DYEnamic ET terminator cycle sequencing ready reaction kit (Amersham Pharmacia Biotech Inc., Piscataway, NJ) and an ABI 3100 sequencer. 159-202 clones for each sample were screened via comparison of partial 16S rRNA gene sequences (500 bp).

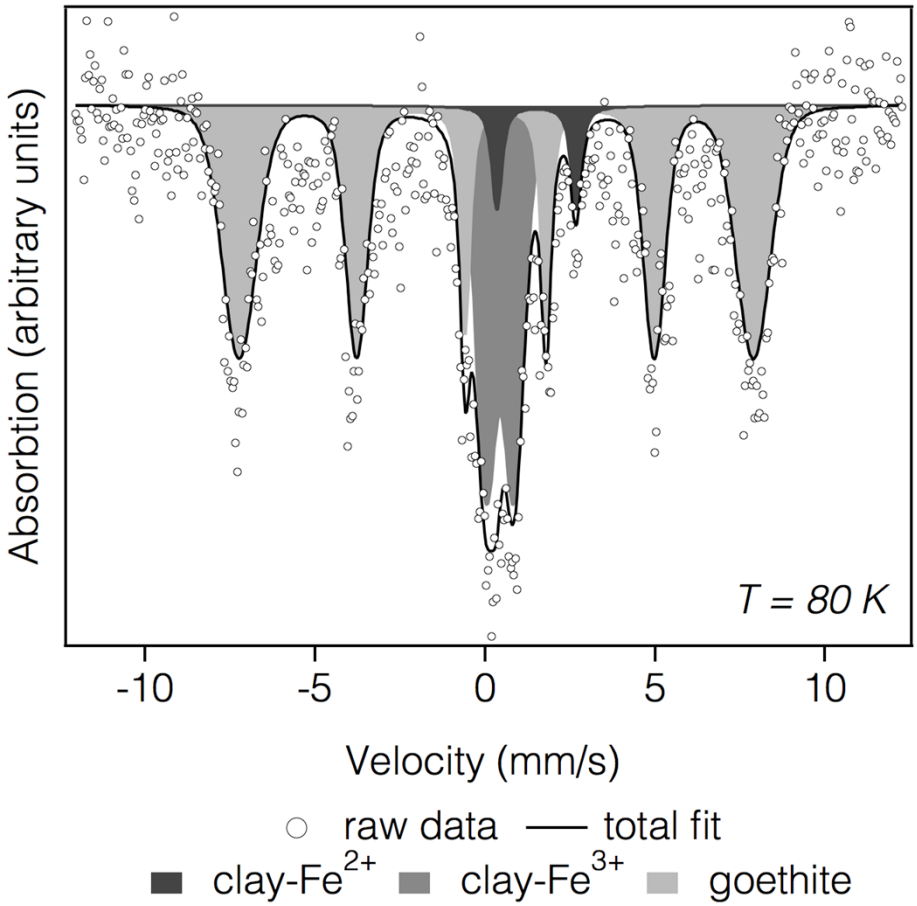

Figure S1. Mössbauer spectra of saprolite sediment from Area 2 of the FRC that was used in this study

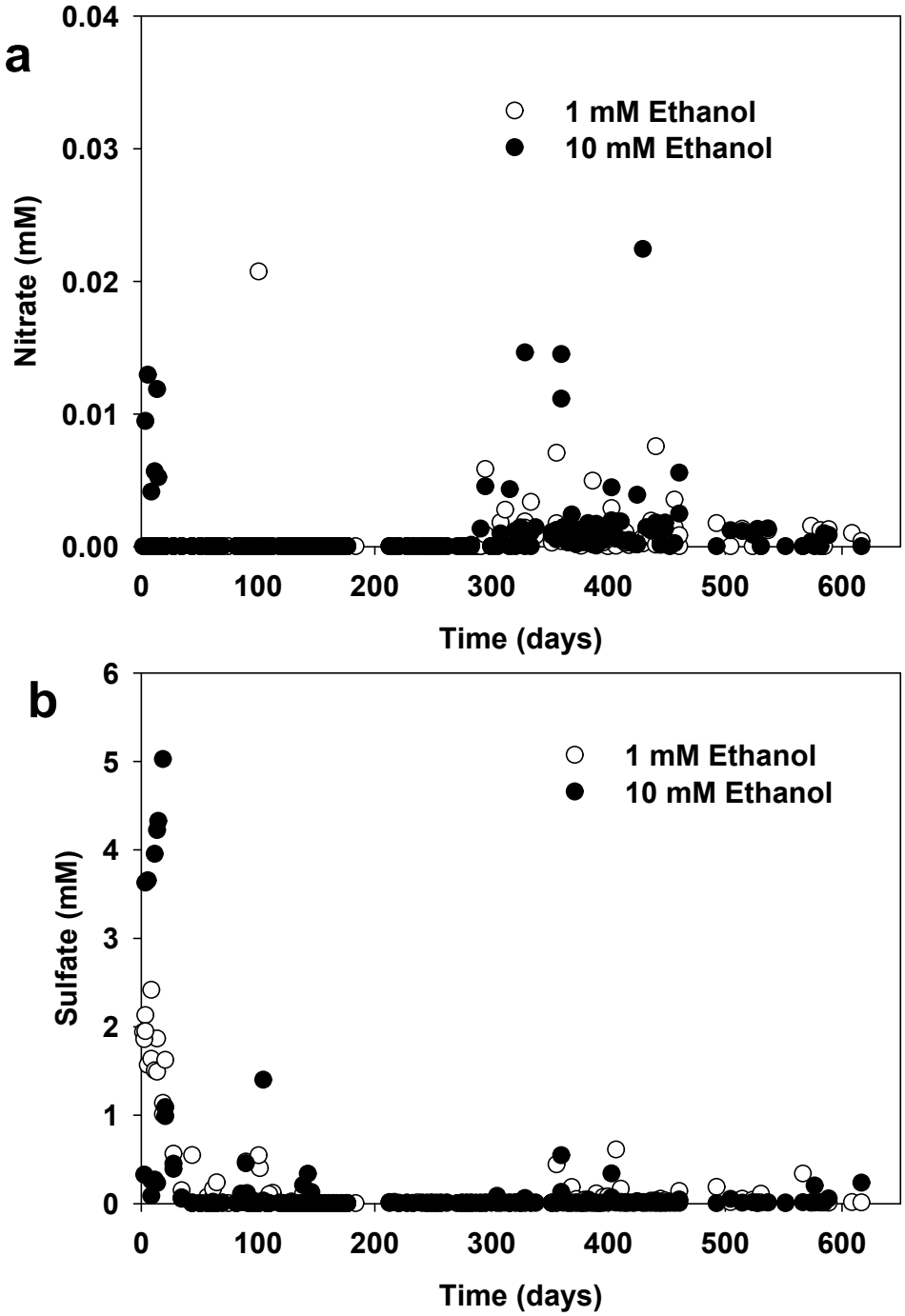

Figure S2. Effluent concentrations of nitrate (a) and sulfate (b) as a function of time during the period of anoxic, ethanol-amended AGW addition (620 d, 31 PVs).