

Supplementary Information for

Elemental Iron: Reduction of Pertechnetate in the Presence of Silica and Periodicity of Precipitated Nano-structures

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10 Pages; 6 Figures; 1 Table

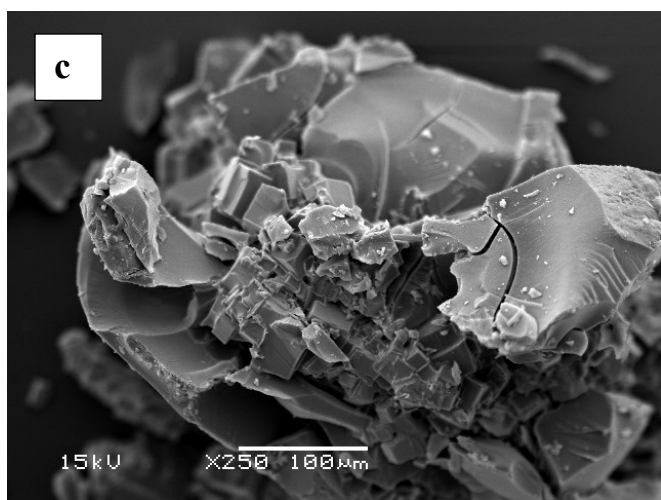
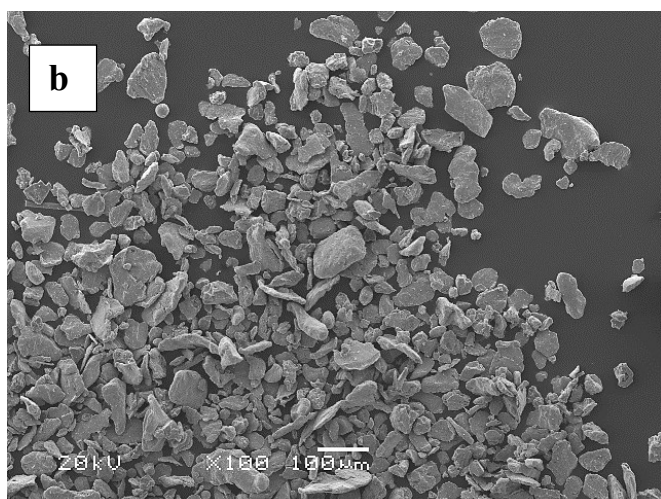
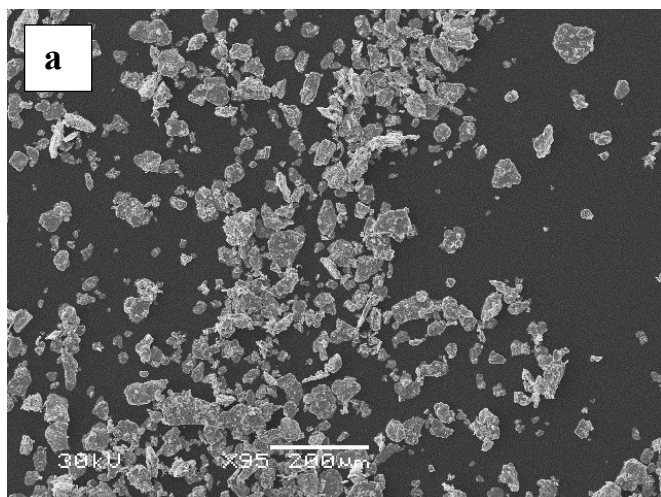


Figure S1. SEM images of (a) ZVI-A (Alfa Aesar, 99+% purity, 75 μm) as received; (b) ZVI-B (Hepure Technologies Inc., 95+% of purity, 297 μm) as received; and (c) synthesized amorphous silica.

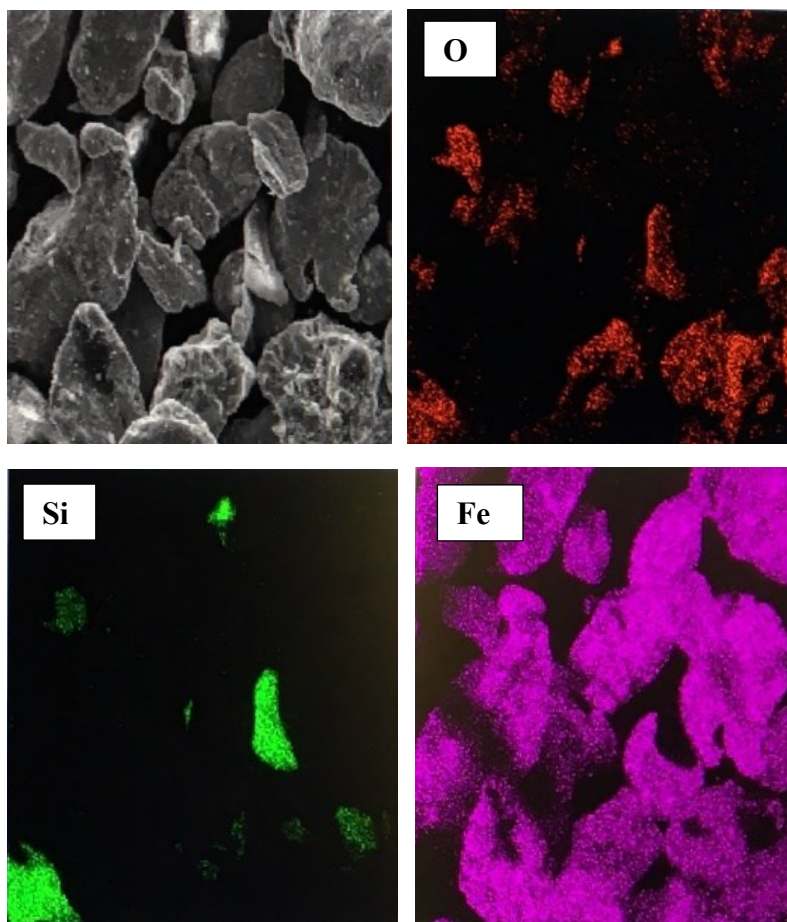


Figure S2. EDX maps for ZVI-B (Hepure Technologies Inc.) as received.

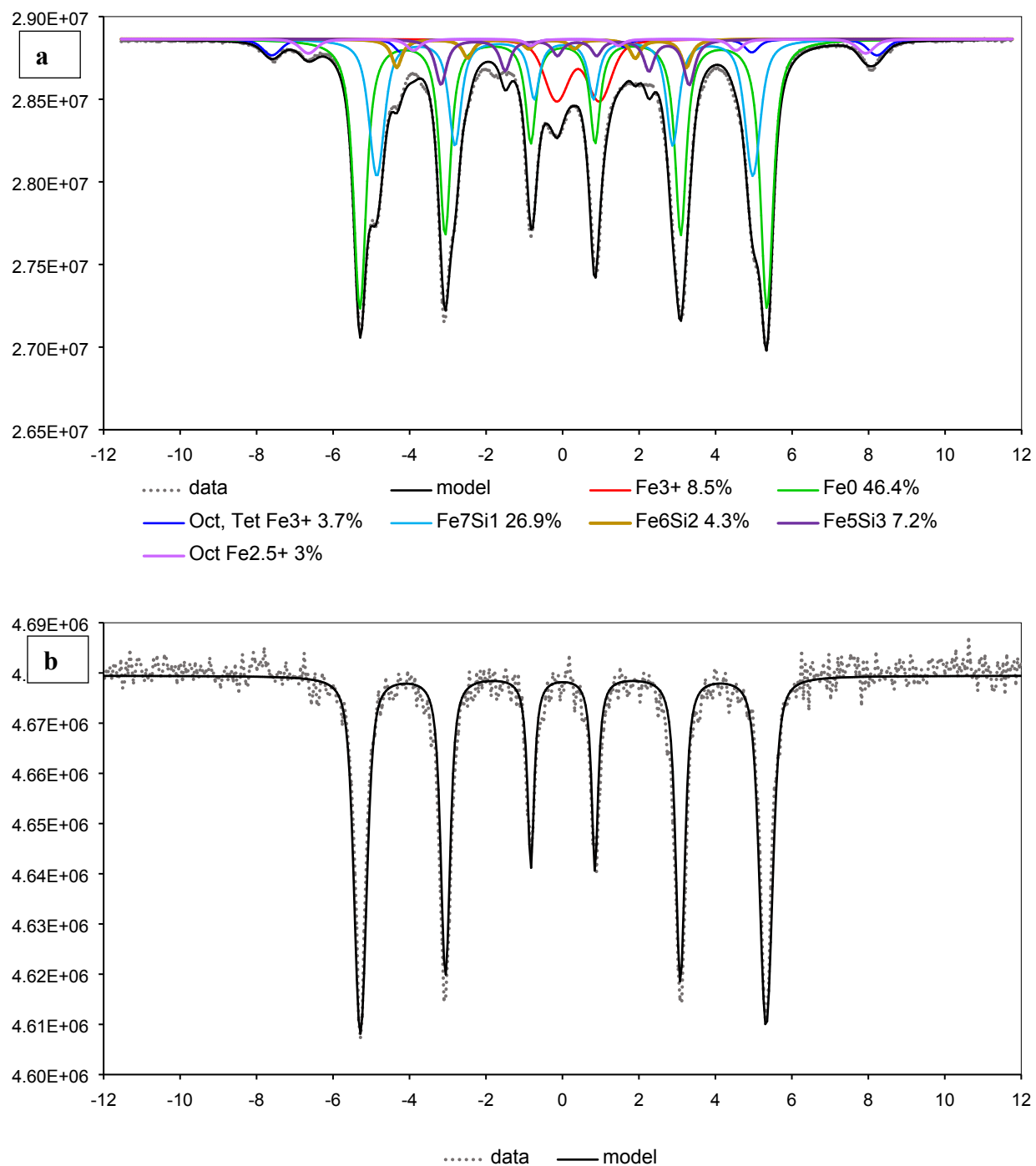


Figure S3. RT Mossbauer spectra for ZVI-B (Hepure Technologies Inc.) as received (a) and ZVI-A as received (b). Fe7Si1, Fe6Si2, and Fe5Si3 in (a) corresponds to number of Fe and Si atoms in bcc Fe (Fe-Si alloy with different number of Si in bcc environment); model in (b) corresponds to pure bcc Fe.

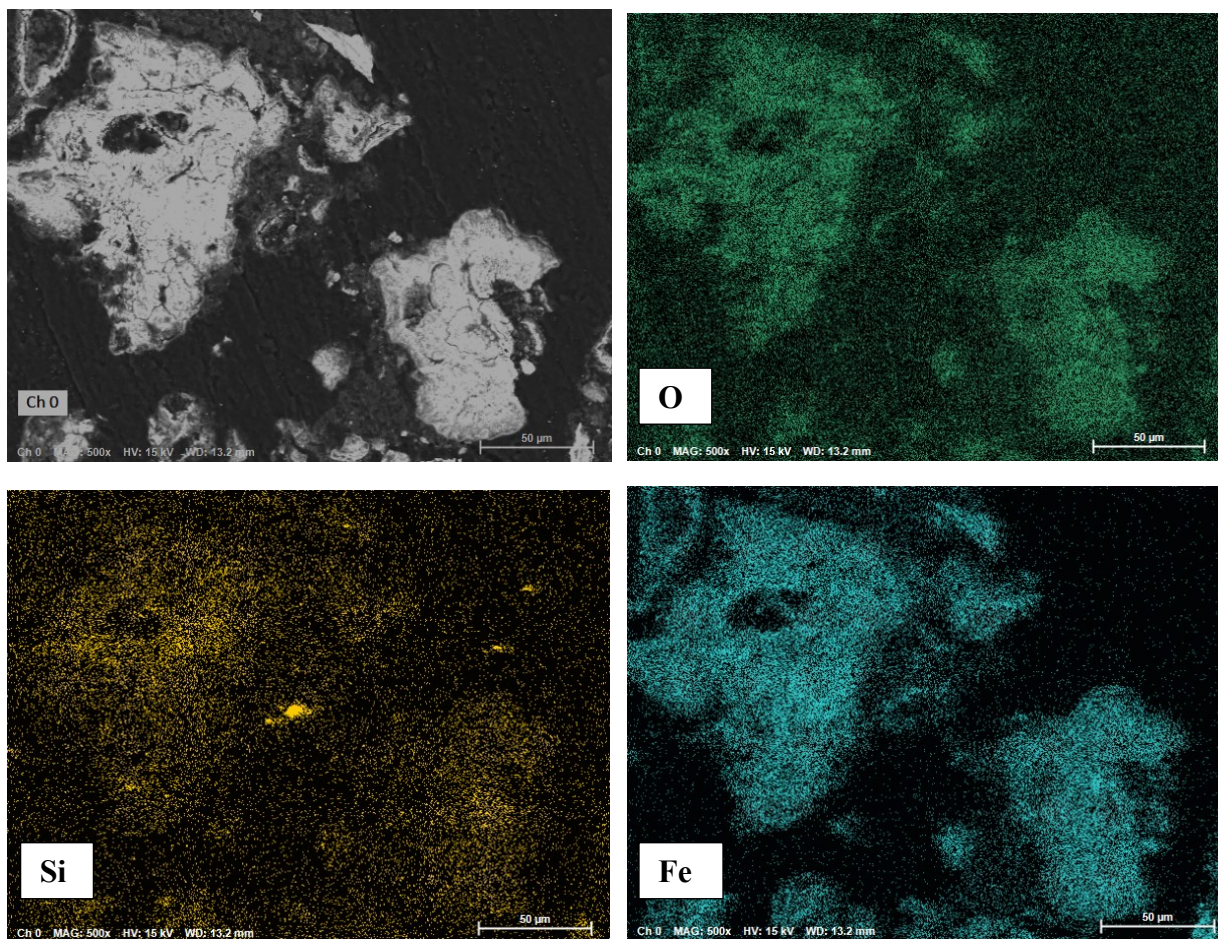
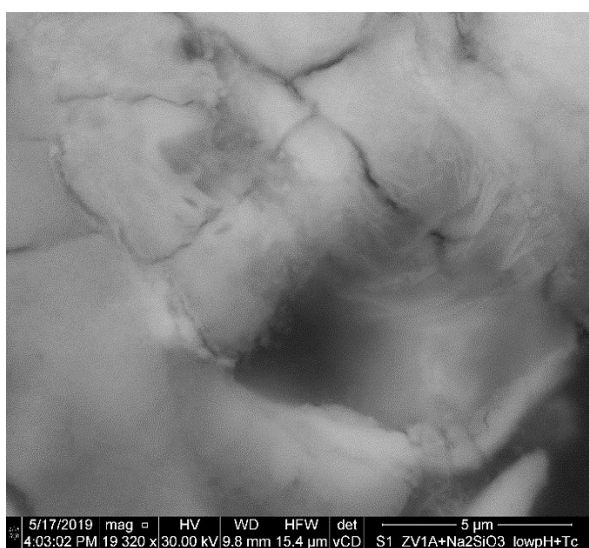
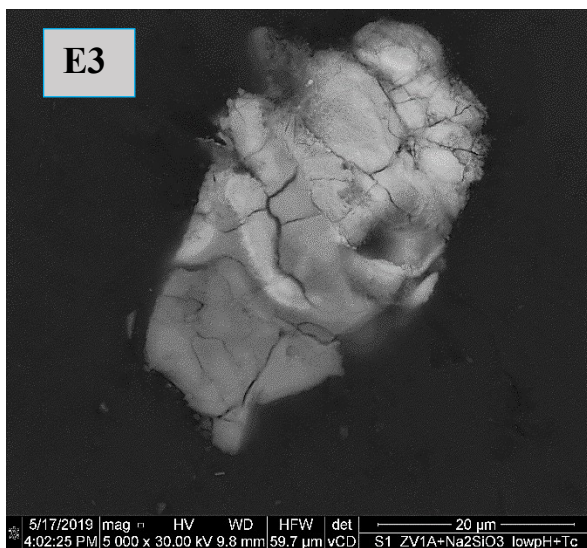
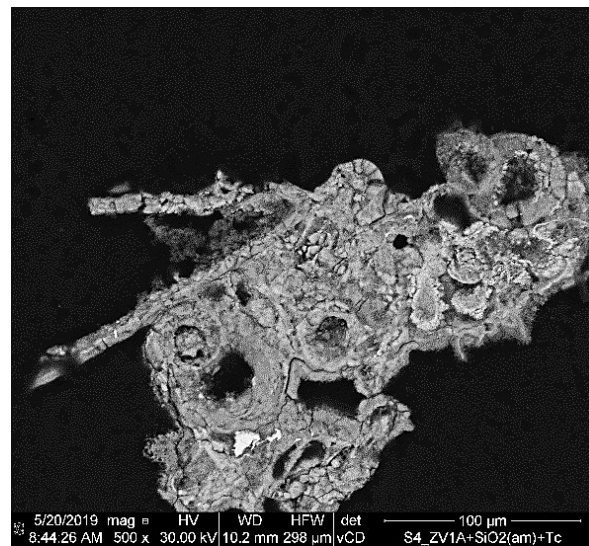
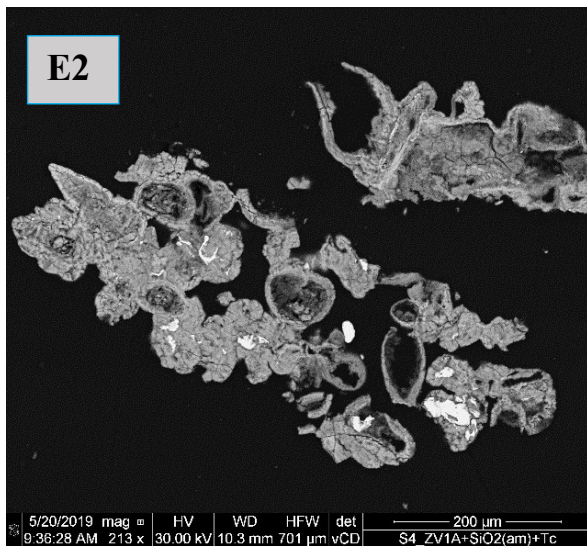
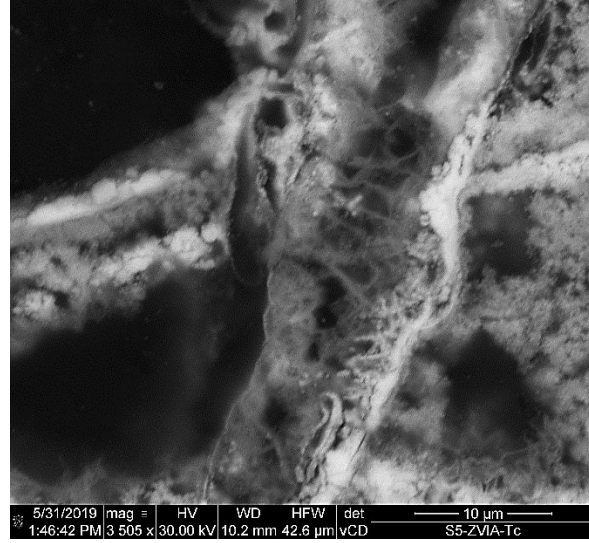
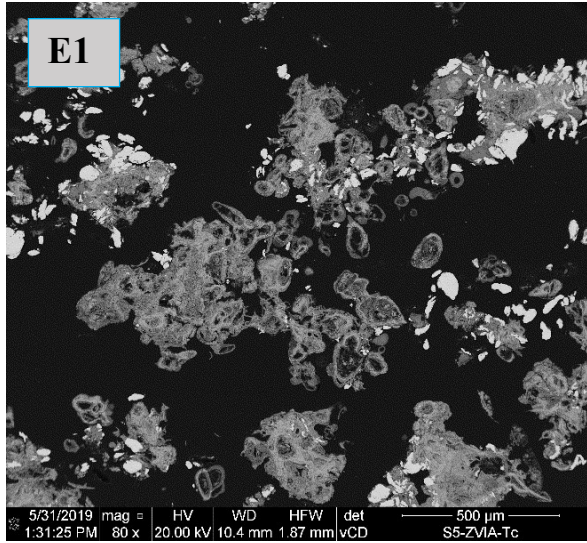
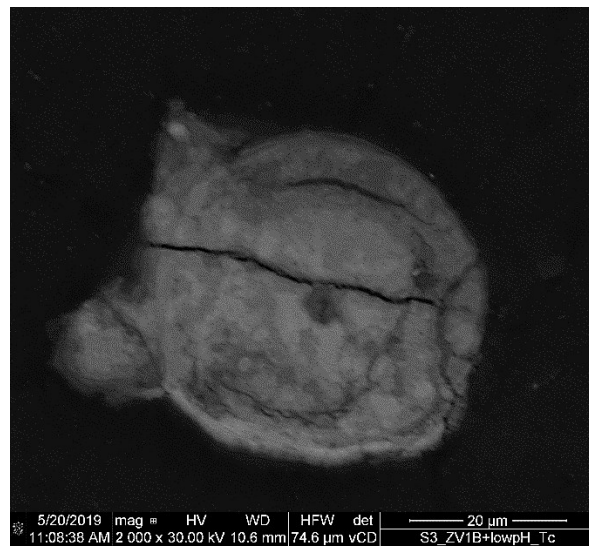
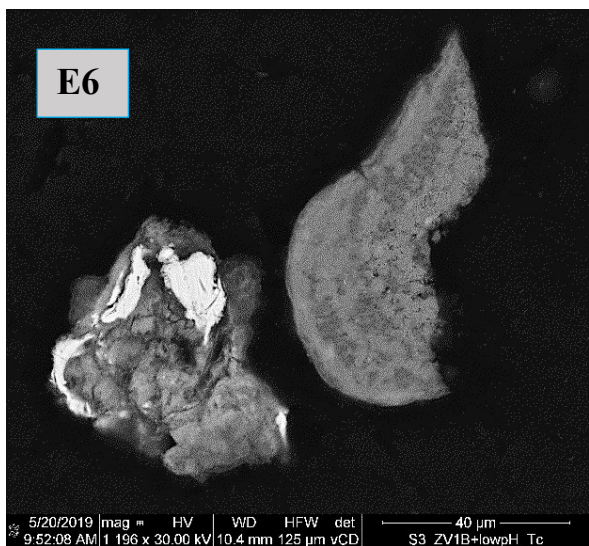
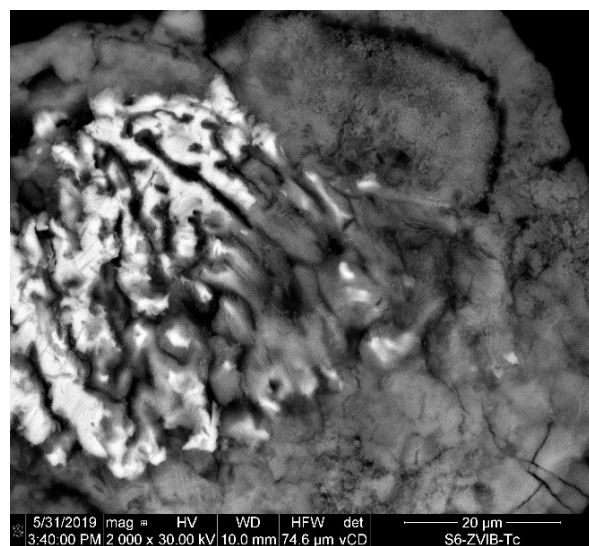
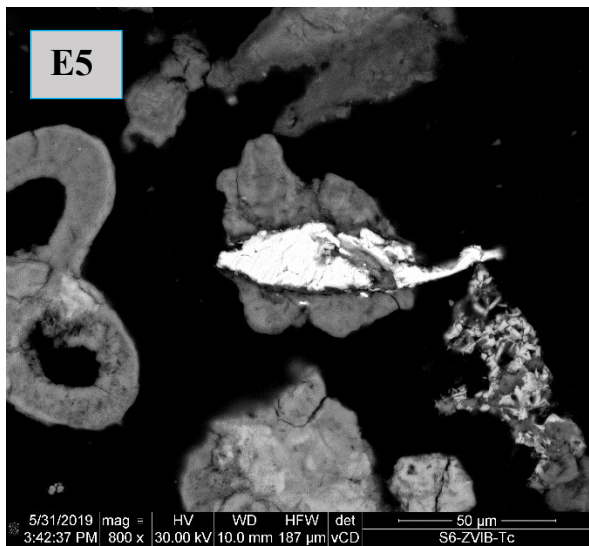
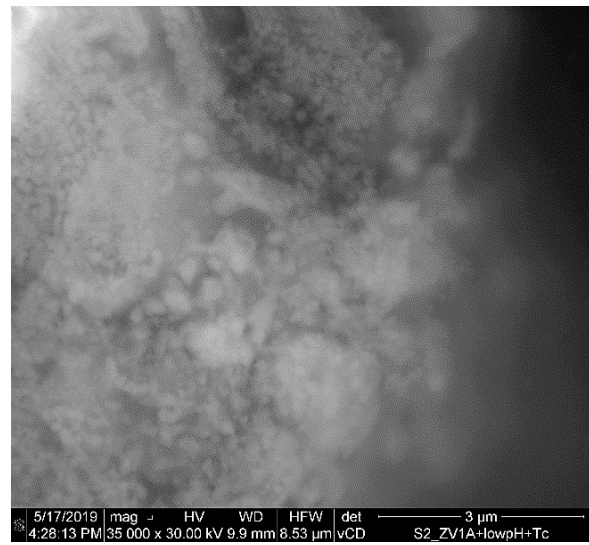
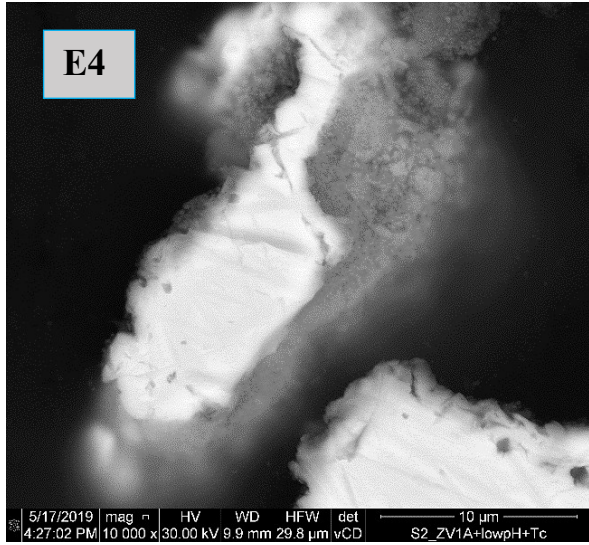


Figure S4. EDX maps for ZVI-B (Hepure Technologies Inc.) after contact with 0.03 mM TcO_4^- in 0.80 M NaCl solution.

(a)





(b)

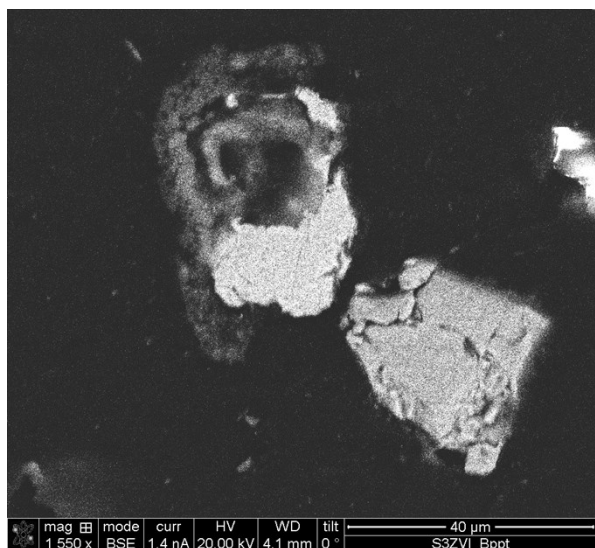


Figure S5. (a) SEM images for the experimental series (E1-E6) after contact with 0.03 mM TcO_4^- in 0.08 mM NaCl solution. (b) SEM image of ZVI-B (E6) before exposure to 0.03 mM TcO_4^- in 0.08 mM NaCl solution.

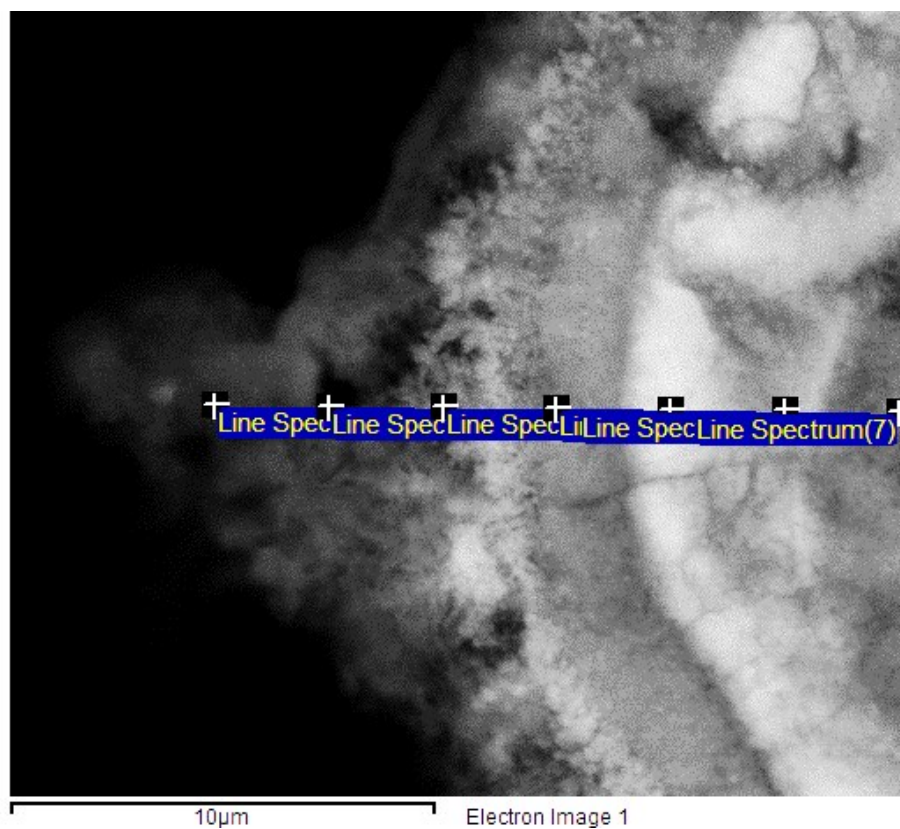


Figure S6. Locations of EDX analysis, series E1 (Table S2).

Table S1. EDX of the layered iron mineral structure in the series E1 (average atomic percent of elements); carbon tape was not excluded from the estimate.

Locations	C	O	Si	Fe	Total
1	44.97	21.79	0.24	33.00	100
2	34.09	5.77		60.14	100
3	28.15	27.48		44.37	100
4	20.34	22.94		56.71	100
5	14.50	33.37		52.14	100
6	17.48	26.40		56.12	100
7	24.87	26.33		48.80	100