

Supporting information

Long-term Fate of Ferric Oxyhydroxide Associated U(VI) During Biological Magnetite Formation

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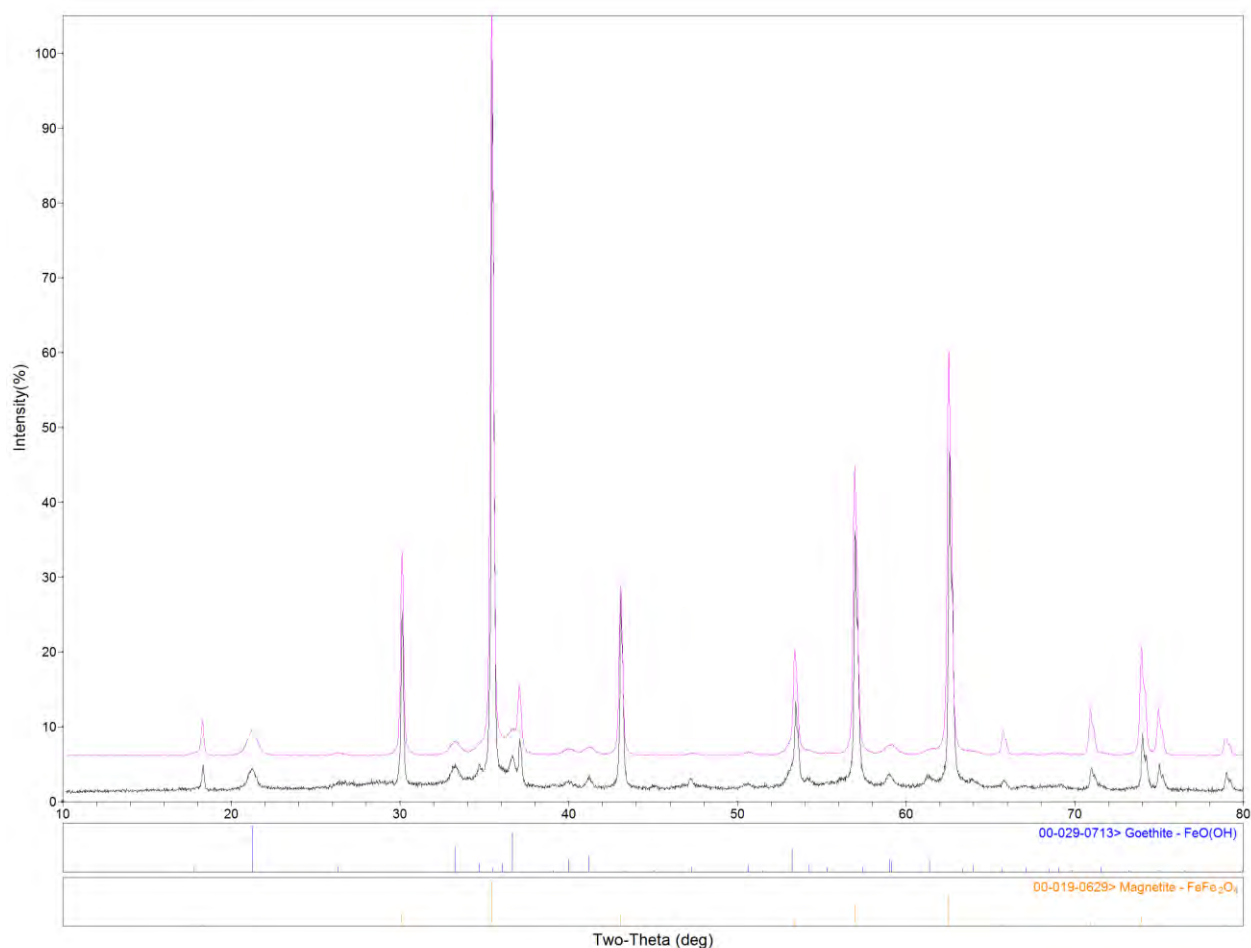


Figure S1. 0.01 mol fraction U sample XRD pattern (black/bottom) with simulation (pink/top) using the phases magnetite (pdf 00-019-0629) and goethite (pdf 00-029-0713) produced with Jade 9.0 (MDI, inc.).

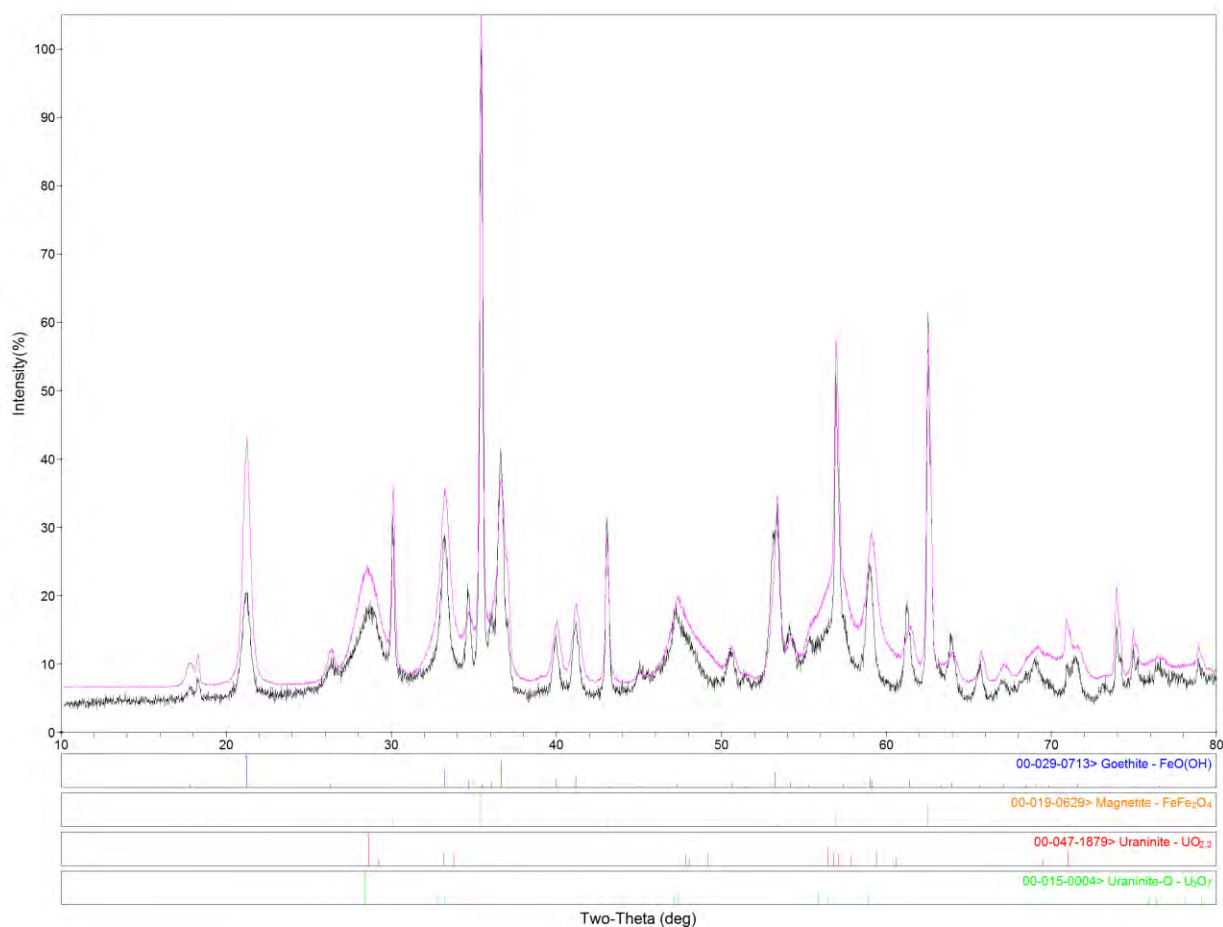
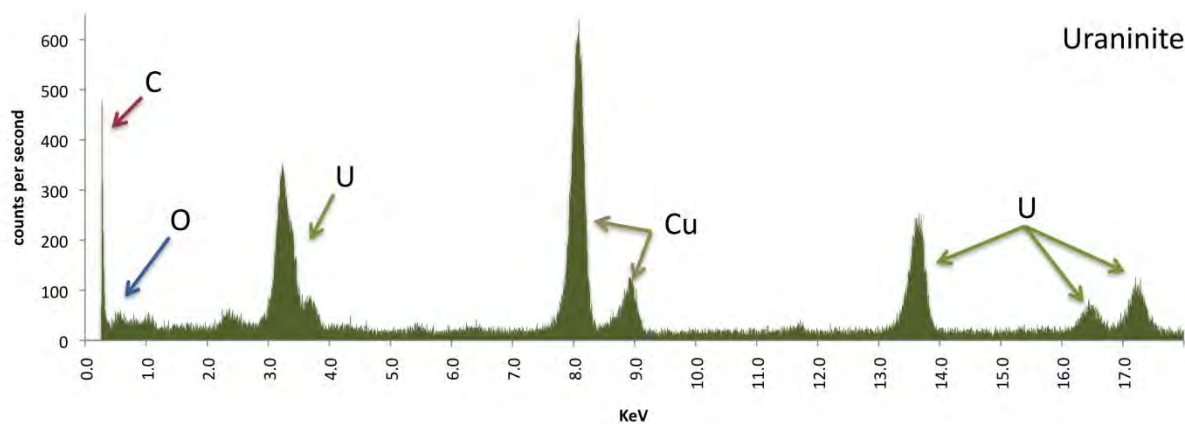


Figure S2. 0.05 mol fraction U sample XRD pattern simulation with magnetite, goethite, and two uraninites (UO_{2.2}, pdf 00-047-1879, and UO_{3.3}, pdf 00-015-0004).

(A)



(B)

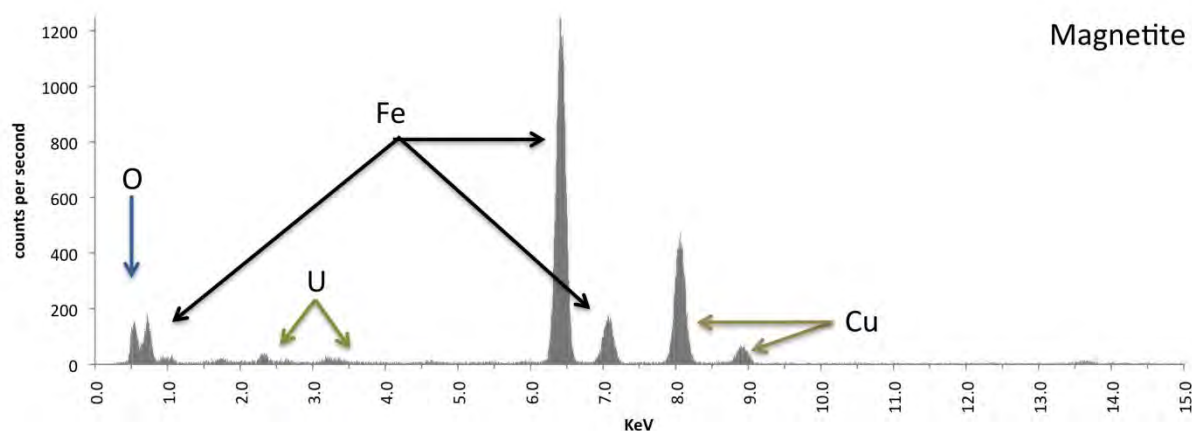


Figure S3. EDS spectra collected from the uraninite (A, top) and magnetite (B, bottom) particles in Figures 3 (right) and 5 (left), respectively. Collected spectra verify composition of the identified mineralogies. Indicated U-C (uraninite) and U-Fe (magnetite) and U-C associations are consistent with EXAFS fittings. Cu in both spectra is from the detector housing.

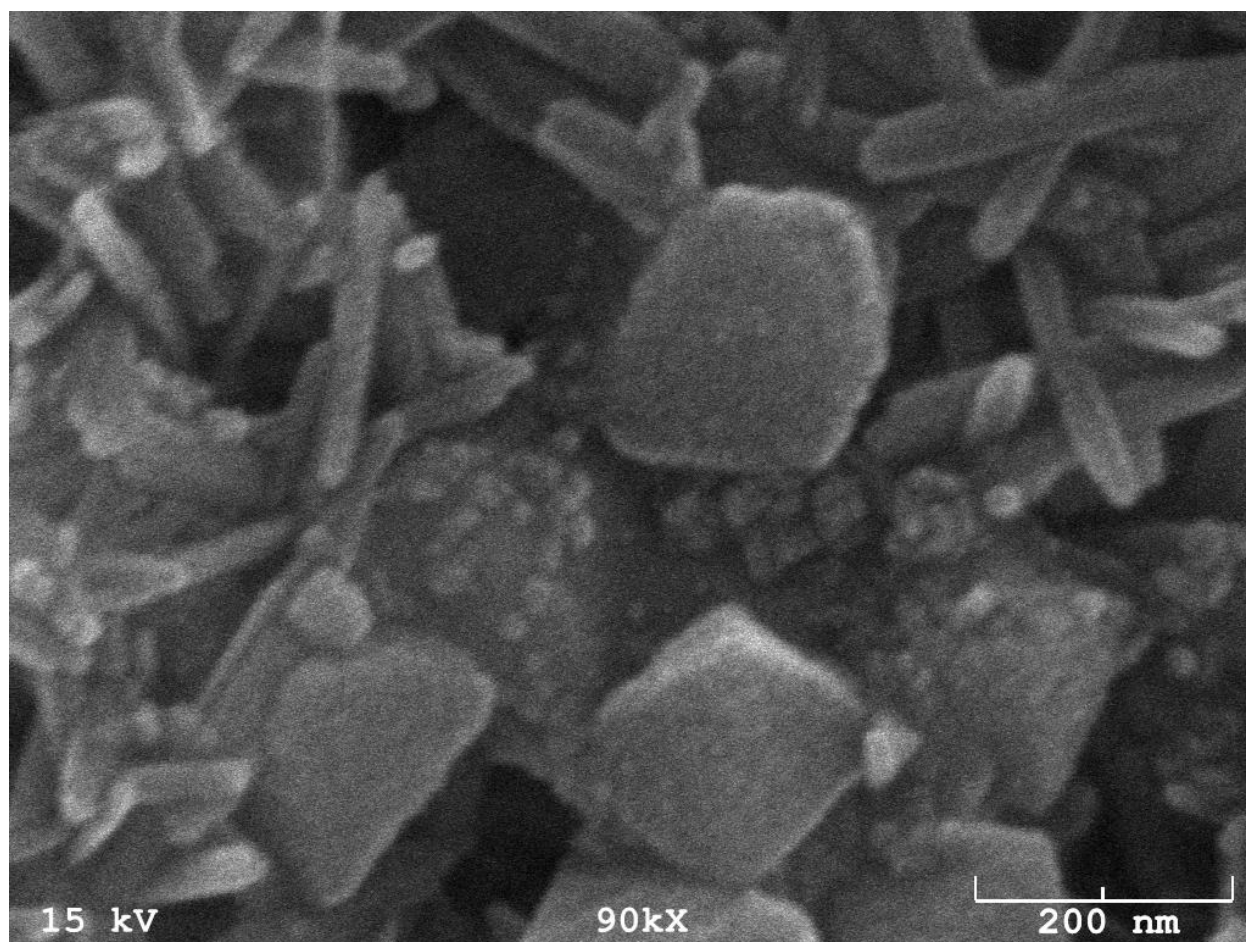


Figure S4. SEM image of black 0.05 CMF U slurry after approximately 4 years showing magnetite octahedra, goethite laths, and uraninite clusters. Culture slurry was deposited on a sample stub and Pt-Ir coated before imaging.

magnetite		uraninite		akaganéite	
reported	measured	reported	measured	reported	measured
4.9	4.7	3.2	3.2	5.3	5.0
3.0	3.0	2.7	2.7	3.3	3.1
2.5	2.6	1.9	1.9	2.5	2.6
1.6	1.6	1.7	1.7	2.3	2.2
1.5	1.4			1.9	1.9
1.1	1.0			1.8	1.8
				1.6	1.6
				1.5	1.5

Table S1. Typical electron diffraction measurements used to identify magnetite, uraninite, and akaganéite.