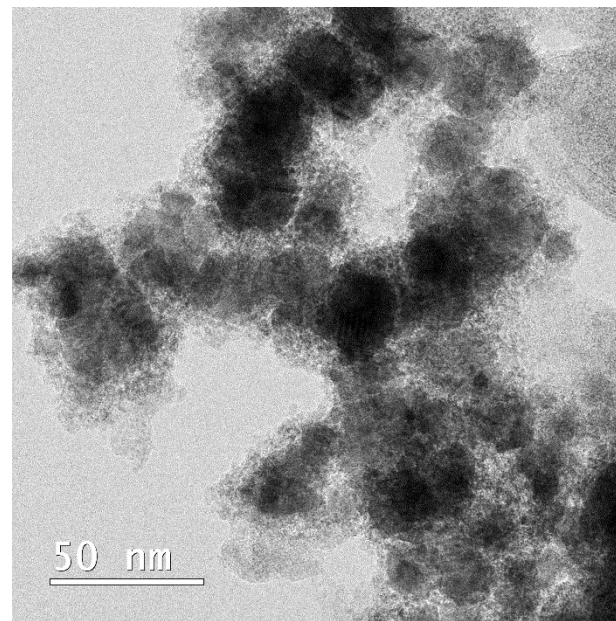


Precipitation and Transformation of Cobalt Sulfide Nanoparticles

Cobalt sulfide precipitates, key phases in the biogeochemical cycling of cobalt and in relevant remediation and resource recovery processes, remain poorly defined under low-temperature aqueous conditions. Here, we systematically studied the Co-(Fe-)sulfides precipitated and aged in environmentally-relevant solutions, defined by different combinations of pH, initial cobalt-to-iron ratios ($[\text{Co}]_{\text{aq}}/[\text{Fe(II)}]_{\text{aq}}$), with/without SO_4 , and the presence/absence of sulfate-reducing bacteria. The revealed precipitation and transformation pathways of Co-(Fe-)sulfides in this study provide a framework for predicting the prevalent Co-bearing phases in various natural and engineered environments.



Biogenic Co-(Fe) sulfide nanoparticles

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National Research Priorities: NSF-Growing Convergence & USDA-Sustainable Use of Natural Resources