

Assessing and Improving Biooxidation for Acid Generation and Rare Earth Element Extraction

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Supporting Information

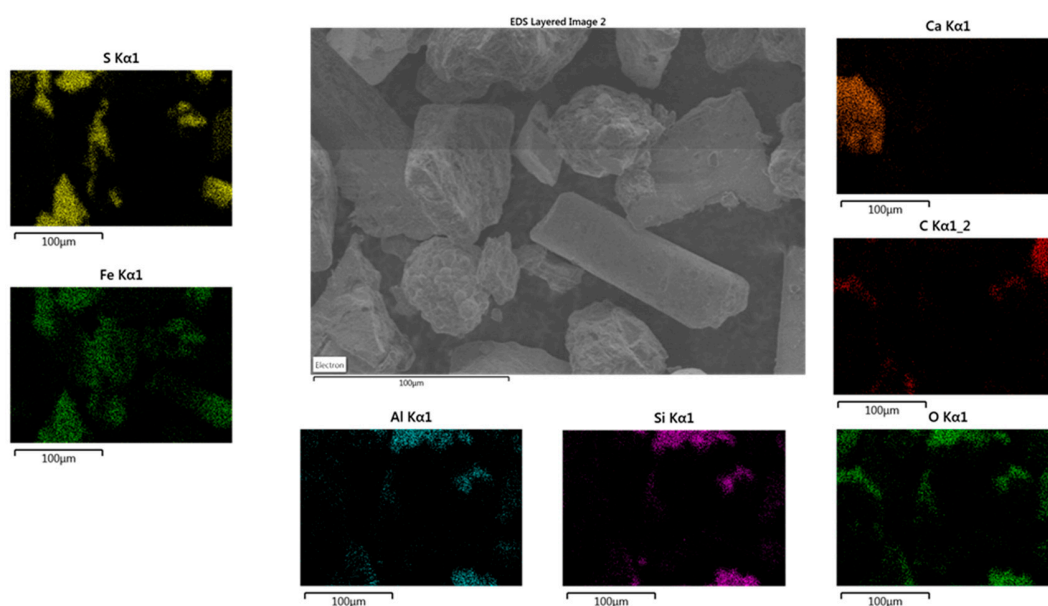


Figure S1. EDS mapping image of typical pyrite concentrate.

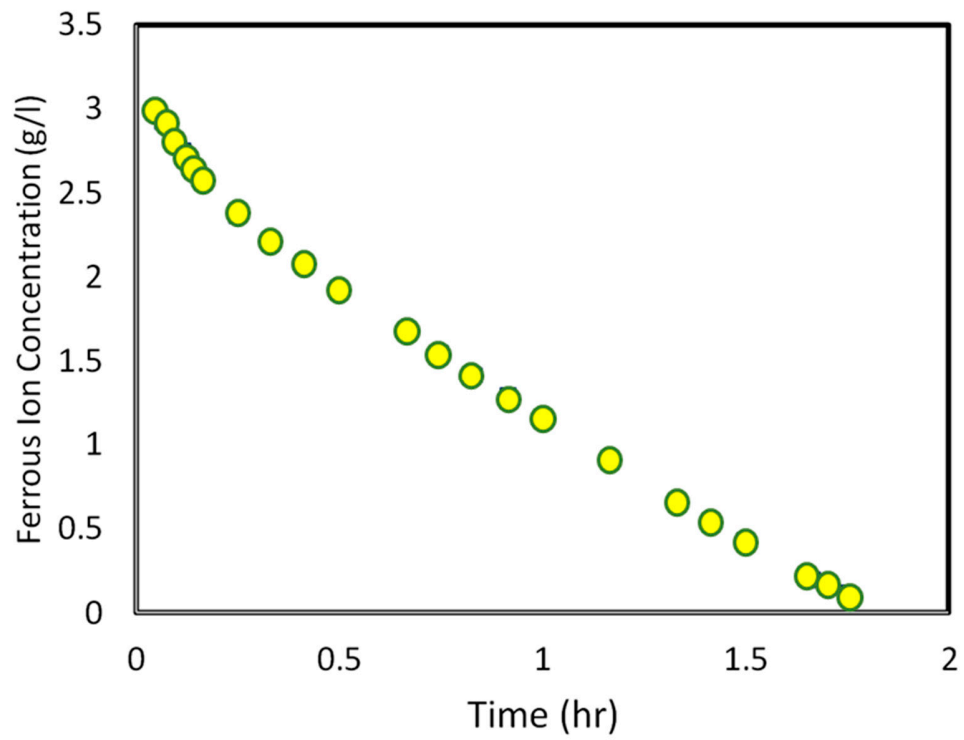


Figure S2. Comparison of ferrous ion concentration versus time for typical biooxidation testing in which ferrous ions were added to a solution and subsequently oxidized by bacteria.

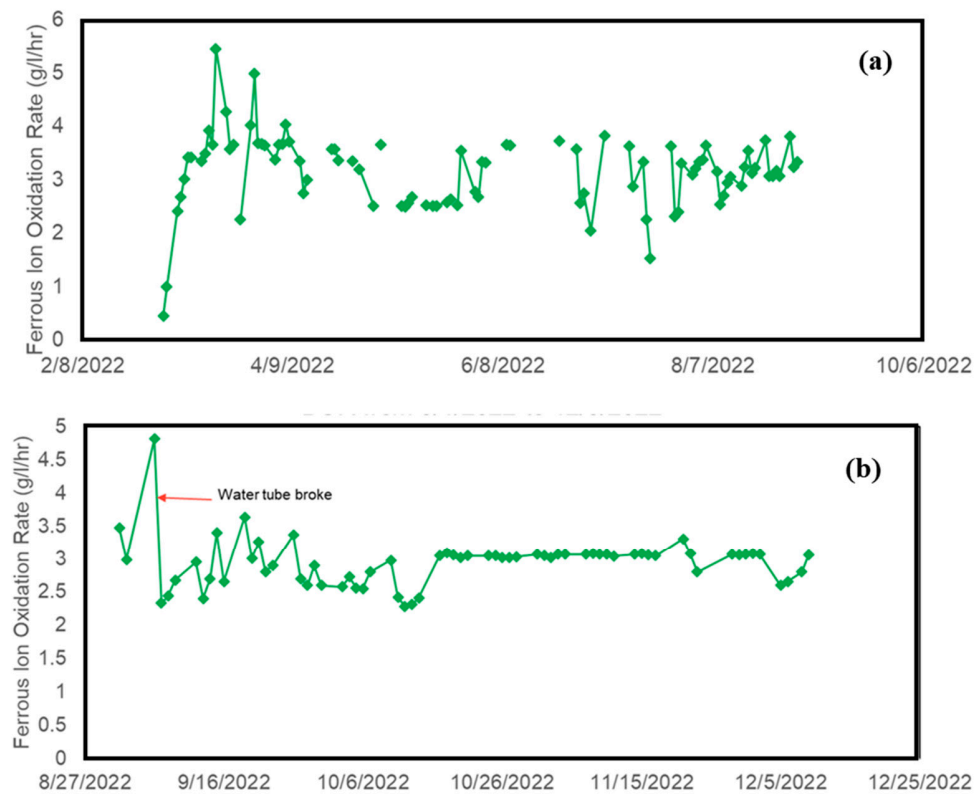


Figure S3. Comparison of ferrous ion oxidation rate (biooxidation rate or BOR) data in the WBB 419 bioreactor (a) from 3/3/2022 to 8/31/2022. (b) from 8/27/2022 to 12/9/2022.

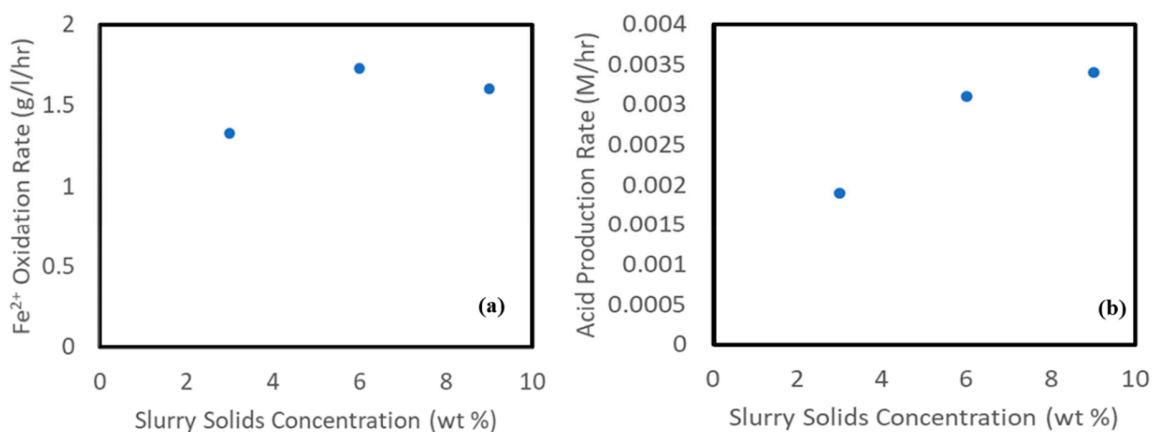


Figure S4. (a) Comparison of slurry solids concentration on ferrous ion oxidation rate; (b) Comparison of slurry solids concentration on acid production rate. The baseline conditions for these comparisons are 500 RPM stirring speed, 35°C, 6 wt % solids, 1.0 l/m air flow rate, 9 K medium without iron, and 6-day residence time.

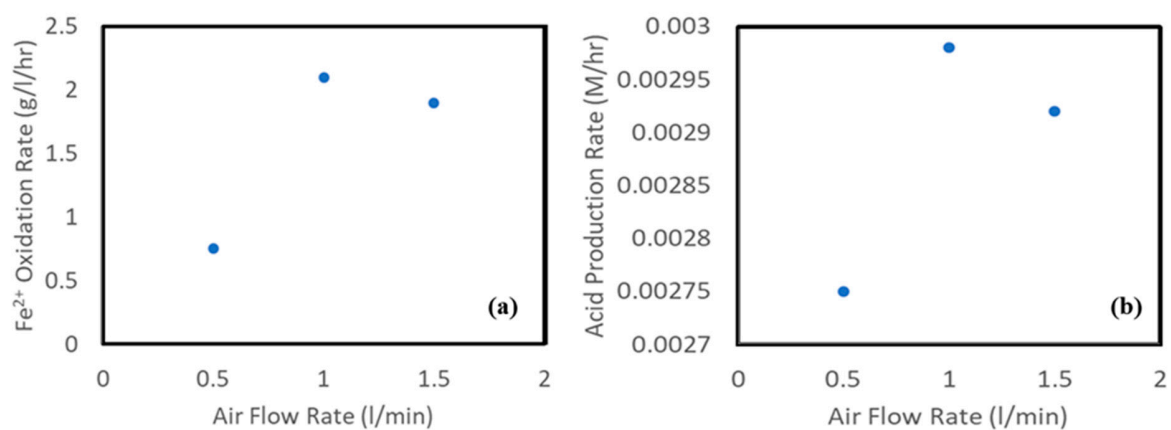


Figure S5. (a) Comparison of air flow rate and ferrous ion oxidation rate; (b) Comparison of air flow rate and acid production rate. The baseline conditions for these comparisons are 500 RPM stirring speed, 35°C, 6 wt % solids, 1.0 l/m air flow rate, 9 K medium without iron, and 6-day residence time.

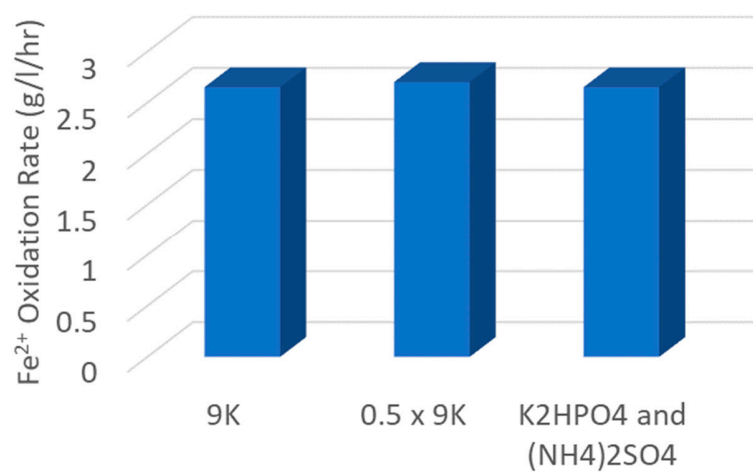


Figure S6. Comparison of nutrient additions on ferrous ion oxidation rate. The baseline conditions for this comparison are 500 RPM stirring speed, 35°C, 6 wt % solids, 1.0 l/m air flow rate, 9 K medium without iron, and 6-day residence time.