

Bioreduction and transformation of Fe(III) oxides by *Shewanella oneidensis* MR-1 under anaerobic conditions

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Shewanella oneidensis MR-1 is recognised to be able to reductively dissolve Fe(III) oxides and to gain energy from this process. While this process is clearly critical to the livelihood of this organism, there have also been reports that the Fe(II) resulting from this reductive process is capable of inducing the Fe(II)-mediated crystallisation of amorphous Fe(III) oxides to more crystalline, less readily reducible forms. In this work, we investigate the *Shewanella*-mediated transformation of amorphous iron oxides to more crystalline forms and present hypotheses as to why such organisms apparently render the iron oxides present to a less bioavailable form.

In this paper, we describe the rate at which *S. oneidensis* reduces Fe(III) to Fe(II) for amorphous iron oxide starting materials and examine the associated kinetics of transformation of AFO to more crystalline forms. The ecological advantage of such a process is a little baffling as the transformation of AFO to more crystalline forms renders Fe(III) less bioavailable. Consideration of the possible ecological impacts of this iron oxide transformation process is provided in this presentation.