

## **Fe(II) - Ferrihydrite Transformation Studies in Oxygen-free Environment**

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The interaction between ferrous ions and amorphous iron oxides leads to a striking phase transformation of the host iron mineral. While this process is clearly critical to the fate of other species, reports on the fundamental drive of this redox crystallisation are still unclear. In particular, whether this process is driven by adsorbed Fe(II) only, or if aqueous Fe(II) species can also transfer electrons, is still unclear from various studies conducted in the past.

To further understand the mechanisms of the pathway in which the mineralization process occurs, anaerobic experiments were conducted in an oxygen-free environment under circumneutral pH at room temperature. In this work, we investigate the abiotic Fe(II)-mediated conversion of ferrihydrite to goethite over a 24 hour period, and analyse the associated transformation kinetics induced by different Fe(II) concentrations using FTIR. Simultaneously the dissolved and adsorbed (i.e. HCl extractable) Fe(II) fractions are quantified. By modeling the transformation kinetics in relation to the amounts of adsorbed and dissolved Fe(II) present, the dominant driving process is revealed.