

74 - Effect of ferrihydrite-organic matter coprecipitation on the Fe(II)-catalyzed transformation of ferrihydrite

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The poorly crystalline Fe(III) hydroxide ferrihydrite is an important sink for carbon, metals and nutrients in the natural environment. Aqueous Fe(II) has been shown to catalyze the transformation of ferrihydrite to more stable phases such as goethite. In soils and sediments, ferrihydrite often precipitates from solutions containing dissolved organic matter. However, little is known about how this coprecipitated OM affects Fe(II)-induced transformation of ferrihydrite to secondary phases. Accordingly, we synthesized a series of 2-line ferrihydrite-OM coprecipitates using dissolved organic matter from a forest litter layer. The products were characterized by X-ray Diffraction, Mössbauer spectroscopy, and Extended X-ray Absorption Fine Structure Spectroscopy. By reacting aqueous Fe(II) (0.2 and 2.0 mM) with 2-line ferrihydrite containing a range of OM contents coprecipitated with ferrihydrite (0-20%), we investigated the extent, rate and pathways of Fe(II)-catalyzed secondary mineralization of ferrihydrite. Such studies can help to assess the reactivity of ferrihydrite in the natural environment.

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