

# Factors Affecting Ni and Zn Hydroxide Precipitate Formation in Soils. (S02-peltier222185-oral)

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## Abstract:

The formation of polynuclear metal hydroxide complexes and surface precipitates can be an important mechanism for metal retention and sequestration in natural soils. In particular, Ni and Zn sorption on Al-bearing clay minerals has been shown to result in the formation of mixed metal-Al hydroxide precipitates. As these precipitates age, their stability increases, resulting in decreased metal release to solution. Thus, these phases may play an important role in reducing metal mobility and bioavailability in natural systems. At present, however, little information is available on the formation of these Ni-Al hydroxides in more heterogeneous systems such as natural soils. In this work, macroscopic and molecular scale techniques have been combined to determine the pathways of metal speciation in several whole soils. Kinetic studies of Ni sorption and desorption were carried out over pH ranges from 6- 8, in the expected region for mixed hydroxide formation. X-ray Absorption Spectroscopy was used to determine the identity of precipitate phases formed during these reactions. In soils with a high clay fraction, there is rapid formation of mixed metal-Al hydroxides that are quite resistant to proton promoted dissolution. In sandy loam soils, however, precipitate formation and stability are heavily influenced by the presence of natural organic matter in the soil.

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