



GEOC: Division of Geochemistry

27 - Layered double hydroxides and their significant role in geochemical processes

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Abstract: Extensive research has been conducted on layered double hydroxides. Their role in impacting geochemical processes is significant. Nickel-, Zn-, and Co-Al-layered double hydroxides (LDHs) have been the most studied LDH phases in geochemistry. Recently, Fe(II)-Al(III)-LDH phases have been shown to form from reactions of Al-oxides and clays with aqueous Fe(II) at circumneutral pH. However, their formation in soils is unresolved. Layered double hydroxides can form from model reactions between divalent metals, such as Ni, Co, and Zn, and Al-bearing phyllosilicates and oxides, and they can occur naturally in contaminated soils. The structure of LDHs consists of layered edge-sharing octahedra sheets, in which the octahedra contain a mixture of divalent and trivalent metals, and the layered sheets are separated by interlayer anions. Over the past 30 years we have learned much about the kinetics and mechanisms of their formation and dissolution, and their importance in environmental remediation. This presentation will feature some of the past findings and remaining questions and research needs.



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