Energetics of Interlayer Confinement Phenomena in Layered Double Hydroxides

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Using integrated calorimetric, structural, spectroscopic and electrochemical methodologies, we studied the interlayer confinement behavior of various metal oxides and hydroxides of electrochemical significance in layered double hydroxides (LDHs). The results suggest the electrochemical properties of these "LDH nanosandwiches" as supercapacitors are tightly correlated to their formation energetics, which are function of LDH composition and type of interlayer compound. The energetics – structure – property relationships are of great importance to both geochemists, chemical engineers and material scientists. Similar interlayer confinement phenomena may also be observed in geochemical environments, such as the Earth's critical zone.