Sorption and desorption of nickel and cobalt on/from goethite: Implication for mobility and metal remediation in Ni laterite Terrain.

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Desorption of sorbed metals provides insight on the contaminant mobility, and the extent adsorbents can be effectively used in remediation technologies. Here, we investigate the sorption, desorption and solubility of nickel and cobalt from goethite sorbed in single and Ni-Co binary system with different concentrations found in laterites and soils as a function of aging. We found that structural incorporation of Ni-Co bi-metal goethite depends on the concentration of the metal, aging duration and the affinity of the metal to the adsorbent. The results from the solubility experiment of Ni sorbed goethite reveal that Ni in sorbed Ni-goethite with 1.38 to 2.65 wt. % Ni is soluble at pH of rain water (5.7) to 6.8 whereas samples with 0.034 to 0.6 wt.% Ni are not soluble at pH of rain water.