

Formation and Dissolution Kinetics of Heavy Metal Surface Precipitates.

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The kinetics of the formation and the dissolution of Ni surface precipitates on pyrophyllite was studied. Ni sorption at pH = 7.5 was initially fast, followed by a gradual decrease in sorption. Based on previous spectroscopic evidence, we attribute the slow reaction stage to nucleation processes on the pyrophyllite surface. The detachment of Ni from surface precipitates at pH = 4 and pH = 6 involves a small amount of Ni being desorbed relatively fast. Thereafter, Ni detachment was extremely slow, and the rate depended strongly on the experimental method. Utilizing a conventional batch technique, further Ni release became negligible. The non-removal of reaction products may have caused the formation of secondary precipitates. Under steady-state conditions a constant Ni detachment rate was observed which we attribute to the dissolution of Ni surface precipitates. Surprisingly, the Ni detachment from pyrophyllite was much slower than the dissolution of crystalline Ni(OH)₂.

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