Comparison of arsenic and mercury release linked to iron and sulfur biogeochemical processes

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Background

The objective is to describe with column experiments the coupling between the mineralogical transformations and the microbial processes that accounts for the mobility of arsenic and mercury in shallow aquifers.

Mobility of As

In As exp., As release is controlled mainly by the complexation with the sulfides (Thioarsenic) and the sorption on residual amorphous ferrhydrite.

Mobility of Hg

In Hg exp., Hg release is controlled either by sorption on sulfides like Fe(III)-containing mackinawite, greigite or/and precipitation of cinnabar HgS.

Raman Analysis

Crystallised mackinawite, residual amorphous 2-Lines ferrhydrite and elemental sulphur are characterized by their Raman bands.

Conclusions

In As exp., As release is controlled mainly by the complexation with the sulfides (Thioarsenic) and the sorption on residual amorphous ferrhydrite.

In Hg exp., Hg release is controlled either by sorption on sulfides like Fe(III)-containing mackinawite, greigite or/and precipitation of cinnabar HgS.

Références
