

Accepted Manuscript

Effect of hydroquinone-induced iron reduction on the stability of Fe(III)-As(V) Co-precipitate and arsenic mobilization

Zidan Yuan, Xu Ma, Xing Wu, Xin Wang, Shaofeng Wang, Yongfeng Jia

PII: S0883-2927(18)30204-X

DOI: [10.1016/j.apgeochem.2018.07.017](https://doi.org/10.1016/j.apgeochem.2018.07.017)

Reference: AG 4135

To appear in: *Applied Geochemistry*

Received Date: 28 February 2018

Revised Date: 28 June 2018

Accepted Date: 21 July 2018

Please cite this article as: Yuan, Z., Ma, X., Wu, X., Wang, X., Wang, S., Jia, Y., Effect of hydroquinone-induced iron reduction on the stability of Fe(III)-As(V) Co-precipitate and arsenic mobilization, *Applied Geochemistry* (2018), doi: 10.1016/j.apgeochem.2018.07.017.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



Effect of Hydroquinone-induced Iron Reduction on the Stability of Fe(III)-As(V) Co-precipitate and Arsenic Mobilization

Zidan Yuan^a, Xu Ma^a, Xing Wu^a, Xin Wang^a, Shaofeng Wang^{a,*}, Yongfeng Jia^{a,*}

^a Key Laboratory of Pollution Ecology and Environmental Engineering, Institute of Applied Ecology, Chinese Academy of Sciences, Shenyang 110016, China

* Corresponding authors,

E-mail address: wangshaofeng@iae.ac.cn (S Wang); yongfeng.jia@iae.ac.cn (Y Jia)

Abstract

Long-term storage of Fe(III)-As(V) co-precipitate wastes derived from the industrial As removal process poses the risk of secondary arsenic pollution to the local environment. However, its stability in only iron-reducing environment remains unclear. The effect of iron reduction by hydroquinone (QH₂) on the stability of co-precipitate at Fe/As molar ratio of 5 was investigated in this study. The results showed that 16.5–93% of Fe(III) reduction in NaOH-neutralized co-precipitate caused 0.1–11% (0.1–8.5 mg·L⁻¹) As release and 0.9–46% (2.6–130 mg·L⁻¹) Fe(II) release at pH 4 and 6. Most of the As(V) and more than half of the Fe(II) generated by the reductive decomposition of Fe(III)-As(V) co-precipitate were retained in solid phases. Solid characterization and thermodynamic calculation indicated that amorphous Fe₃(AsO₄)₂ was probably the major secondary mineral for As immobilization. At pH 8, 11–39% As and less than 4% Fe(II) were released into solution after 3.6–87% Fe(III) was reduced to Fe(II). Both amorphous Fe₃(AsO₄)₂ and Fe(II,III) (hydr)oxides

Download English Version:

<https://daneshyari.com/en/article/8863012>

Download Persian Version:

<https://daneshyari.com/article/8863012>

[Daneshyari.com](https://daneshyari.com)