

## Accepted Manuscript

Review of arsenic metallurgy: Treatment of arsenical minerals and the immobilization of arsenic

Amir Mohammad Nazari, Rebecca Radzinski, Ahmad Ghahreman

PII: S0304-386X(16)30709-5  
DOI: doi: [10.1016/j.hydromet.2016.10.011](https://doi.org/10.1016/j.hydromet.2016.10.011)  
Reference: HYDROM 4447

To appear in: *Hydrometallurgy*

Received date: 14 March 2016  
Revised date: 29 August 2016  
Accepted date: 7 October 2016



Please cite this article as: Nazari, Amir Mohammad, Radzinski, Rebecca, Ghahreman, Ahmad, Review of arsenic metallurgy: Treatment of arsenical minerals and the immobilization of arsenic, *Hydrometallurgy* (2016), doi: [10.1016/j.hydromet.2016.10.011](https://doi.org/10.1016/j.hydromet.2016.10.011)

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.

# Review of arsenic metallurgy: treatment of arsenical minerals and the immobilization of arsenic

Amir Mohammad Nazari\*, Rebecca Radzinski, Ahmad Ghahreman<sup>1</sup>

Robert M. Buchan Department of Mining, Queen's University  
25 Union Street, Kingston, Ontario, K7L 3N6, Canada

## Abstract

The attention of mining industry has directed towards the processing of complex arsenic-bearing minerals due to a decrease in the traditional base metal reserves. Arsenic present in the minerals is usually mobilized through hydrometallurgical and pyrometallurgical processes and subsequently released into the environment. Arsenic has become a worldwide environmental challenge in the metals and mining industry. Hence, arsenic in the process streams must be immobilized properly prior to the discard of waste. The initial step for arsenic fixation is the oxidation of trivalent arsenic in order to improve both arsenic removal and stability of the final arsenical residues. Arsenic immobilization step could be accomplished using hydrometallurgical and pyrometallurgical techniques. Whereas, pentavalent arsenic is commonly precipitated using hydrometallurgical processes consisting of lime neutralization, sulfide precipitation, co-precipitation of arsenic with ferric ions and scorodite precipitation. In the pyrometallurgical method arsenic and sulfur are captured using a fixing agent such as calcium and ferrous salts to produce a stable residue. This paper aims to provide a comprehensive review on past, current and future arsenic immobilization techniques related to the mining industry with a large focus on the practiced processes and new developments.

**Keywords:** Arsenic immobilization, hydrometallurgical process, oxidation, calcium arsenate, ferric arsenate, scorodite.

---

\*Corresponding author: amn5@queensu.ca

<sup>1</sup>ahmad.g@queensu.ca

Download English Version:

<https://daneshyari.com/en/article/6659154>

Download Persian Version:

<https://daneshyari.com/article/6659154>

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