

Accepted Manuscript

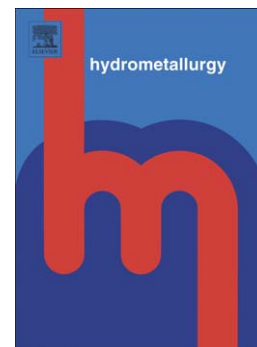
Effects of different energy sources on cell adhesion and bioleaching of a chalcopyrite concentrate by extremophilic archaeon *Acidianus copahuensis*

Camila Castro, Edgardo Donati

PII: S0304-386X(16)30061-5
DOI: doi: [10.1016/j.hydromet.2016.02.014](https://doi.org/10.1016/j.hydromet.2016.02.014)
Reference: HYDROM 4302

To appear in: *Hydrometallurgy*

Received date: 8 July 2015
Revised date: 15 October 2015
Accepted date: 21 February 2016



Please cite this article as: Castro, Camila, Donati, Edgardo, Effects of different energy sources on cell adhesion and bioleaching of a chalcopyrite concentrate by extremophilic archaeon *Acidianus copahuensis*, *Hydrometallurgy* (2016), doi: [10.1016/j.hydromet.2016.02.014](https://doi.org/10.1016/j.hydromet.2016.02.014)

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.

**Effects of different energy sources on cell adhesion and
bioleaching of a chalcopyrite concentrate by extremophilic
archaeon *Acidianus copahuensis***

Camila Castro^{1*} and Edgardo Donati¹

¹CINDEFI (CCT La Plata —CONICET, U.N.L.P.), Facultad de Ciencias Exactas,
Universidad Nacional de La Plata, Calle 47 y 115, (1900) La Plata, Argentina.

Abstract

Bioleaching is an alternative technology for recovering metals from mineral ores; thermophilic microorganisms instead of mesophiles can greatly improve metal solubilization, particularly from refractory mineral species. *A. copahuensis* is a new species of thermophilic archaea, recently isolated in our laboratory. The effect of culture growth history on the attachment of *A. copahuensis* to a chalcopyrite concentrate was investigated in shake flasks at 65 °C. Cells adapted to growth with chalcopyrite as energy source showed higher attachment to the mineral concentrate. *A. copahuensis* cells reached 100 % of copper extraction in the bioleaching of chalcopyrite concentrate carried out in shake flasks cultures incubated at 65 °C and pH 2.0. This high bioleaching yield was achieved even at that not so low initial pH value probably because this archaeal species is able to form sufficient amounts of ferric iron but keeping low redox potential (Eh) values. This work also describes the effect of the addition of other energy sources on the bioleaching activity. *A. copahuensis* achieved the best copper extraction without any addition but copper extraction decreased when alternative substrates were added.

Keywords: Bioleaching; Chalcopyrite; Thermophiles; Microbial attachment; *Acidianus copahuensis*; Archaeon

Download English Version:

<https://daneshyari.com/en/article/6659233>

Download Persian Version:

<https://daneshyari.com/article/6659233>

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