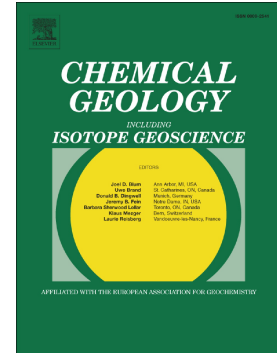


# Accepted Manuscript

Iron-isotope systematics from the Batu Hijau Cu-Au deposit,  
Sumbawa, Indonesia

Christine M. Wawryk, John D. Foden



PII: S0009-2541(17)30362-5  
DOI: doi: [10.1016/j.chemgeo.2017.06.004](https://doi.org/10.1016/j.chemgeo.2017.06.004)  
Reference: CHEMGE 18361  
To appear in: *Chemical Geology*  
Received date: 7 February 2017  
Revised date: 18 May 2017  
Accepted date: 5 June 2017

Please cite this article as: Christine M. Wawryk, John D. Foden , Iron-isotope systematics from the Batu Hijau Cu-Au deposit, Sumbawa, Indonesia, *Chemical Geology* (2017), doi: [10.1016/j.chemgeo.2017.06.004](https://doi.org/10.1016/j.chemgeo.2017.06.004)

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.

## IRON-ISOTOPE SYSTEMATICS FROM THE BATU HIJAU CU-AU DEPOSIT, SUMBAWA, INDONESIA

Christine M. Wawryk<sup>\*a</sup>, John D. Foden<sup>a</sup>.

<sup>a</sup>*Centre for Tectonics, Research and Exploration, University of Adelaide, North Tce, South Australia, 5005, Australia*

*\*corresponding author. Tel: +61 8 8313 1717. E-mail address: christine.wawryk@adelaide.edu.au*

### ABSTRACT

This study examines the fractionation of iron isotopes as a reflection of processes that govern the co-magmatic formation of a hydrothermal ore system of a classic porphyry copper deposit. We present iron isotope analyses, measured using multi-collector ICPMS, of magmatic intrusive rocks and coeval hypogene ore minerals from the Batu Hijau porphyry copper-gold deposit in Sumbawa, Indonesia. Isotopic analysis were made of the intrusive magmatic host rocks to the deposit, ranging from sub-volcanic andesite and quartz diorite to tonalite, and of hypogene chalcopyrite, bornite and magnetite ore mineral separates.

Iron isotope values of andesite and quartz diorite range from  $\delta^{57}\text{Fe} = 0.17 \pm 0.05\text{‰}$  to  $0.26 \pm 0.05\text{‰}$ . The more felsic, differentiated dacite and tonalite have heavier iron isotope values ( $\delta^{57}\text{Fe} = 0.27 \pm 0.08\text{‰}$  to  $0.32 \pm 0.08\text{‰}$ ) than the intermediate and mafic rocks. Heavy iron isotopes are positively correlated with  $\text{SiO}_2$  and negatively correlated with  $\text{MgO}$ ,  $\text{CaO}$ ,  $\text{TiO}_2$  and  $\text{V}$  suggesting that crystallisation of clinopyroxene, amphibole and magnetite is the primary control on isotopic evolution of the melt. These isotopic trends are supported by thermodynamic (rhyolite-MELTS) modelling of crystal fractionation using published mineral-melt fractionation factors, and demonstrate that the isotopic evolution of the Batu Hijau melts was controlled by crystal fractionation.

Download English Version:

<https://daneshyari.com/en/article/5782826>

Download Persian Version:

<https://daneshyari.com/article/5782826>

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