

## Accepted Manuscript

The dependence of metal-silicate partitioning of moderately volatile elements on oxygen fugacity and Si contents of Fe metal: Implications for their valence states in silicate liquids

Antje K. Vogel, Eleanor S. Jennings, Vera Laurenz, David C. Rubie, Daniel J. Frost

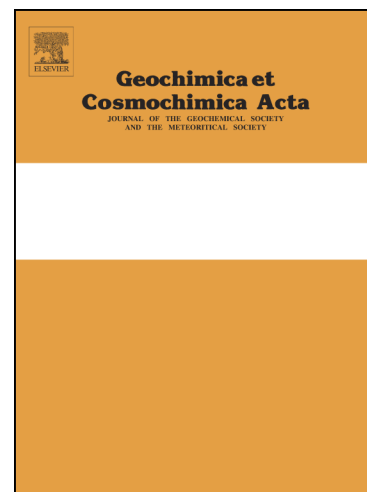
PII: S0016-7037(18)30337-5  
DOI: <https://doi.org/10.1016/j.gca.2018.06.022>  
Reference: GCA 10811

To appear in: *Geochimica et Cosmochimica Acta*

Received Date: 24 August 2017  
Accepted Date: 17 June 2018

Please cite this article as: Vogel, A.K., Jennings, E.S., Laurenz, V., Rubie, D.C., Frost, D.J., The dependence of metal-silicate partitioning of moderately volatile elements on oxygen fugacity and Si contents of Fe metal: Implications for their valence states in silicate liquids, *Geochimica et Cosmochimica Acta* (2018), doi: <https://doi.org/10.1016/j.gca.2018.06.022>

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.



**The dependence of metal-silicate partitioning of moderately volatile elements on oxygen fugacity and Si contents of Fe metal: Implications for their valence states in silicate liquids**

Antje K. Vogel<sup>1,2</sup>, Eleanor S. Jennings<sup>1,3\*</sup>, Vera Laurenz<sup>1</sup>, David C. Rubie<sup>1</sup>, Daniel J. Frost<sup>1</sup>

<sup>1</sup>Bayerisches Geoinstitut, Universität Bayreuth, 95440 Bayreuth, Germany

<sup>2</sup>Lava-Dome, Deutsches Vulkanmuseum Mendig, Brauerstr. 1, 56743 Mendig, Germany

<sup>3</sup>Department of Earth and Planetary Sciences, Birkbeck, University of London, Malet Street, London WC1E 7HX, UK

\*Corresponding author ([e.jennings@bbk.ac.uk](mailto:e.jennings@bbk.ac.uk))

**ABSTRACT**

The volatile siderophile elements are important tracers of the delivery of volatile elements to the Earth. Their concentrations in the bulk silicate Earth are a function of the relative timing of their accretion and their sequestration into the core: a comprehensive understanding of their metal-silicate partitioning behaviour is therefore required in order to infer the volatile element accretion history. We present new partitioning data between liquid metal and liquid silicate at 11 GPa for a suite of volatile siderophile elements: Ag, As, Au, Cu, Ge, P, Pb, Sb, Sn. We focus particularly on determining their valence states and the effects of Si on partitioning, which are required in order to extrapolate from experimental conditions to core-formation conditions. It was found that all elements have weak to strong positive interaction parameters with Si. At low  $fO_2$ , redox equilibria dictate that the siderophile elements should become more siderophile. However, at low  $fO_2$ , Si also partitions more strongly into the metal. Given the

Download English Version:

<https://daneshyari.com/en/article/8910637>

Download Persian Version:

<https://daneshyari.com/article/8910637>

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