

Accepted Manuscript



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PII: S0883-2927(18)30146-X

DOI: [10.1016/j.apgeochem.2018.05.024](https://doi.org/10.1016/j.apgeochem.2018.05.024)

Reference: AG 4101

To appear in: *Applied Geochemistry*

Received Date: 28 February 2018

Revised Date: 16 May 2018

Accepted Date: 31 May 2018

Please cite this article as: Li, X., Puhakka, E., Ikonen, J., Söderlund, M., Lindberg, A., Holgersson, S., Martin, A., Siitari-Kauppi, M., Sorption of Se species on mineral surfaces, part I: Batch sorption and multi-site modelling, *Applied Geochemistry* (2018), doi: 10.1016/j.apgeochem.2018.05.024.

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Sorption of Se species on mineral surfaces, Part I: Batch sorption and multi-site modelling

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Abstract: The sorption behavior of Se(IV) on Grimsel granodiorite and its main minerals, plagioclase, K-feldspar, quartz and biotite, were investigated in Grimsel groundwater simulant in a large Se concentration range (from 1.66×10^{-10} M to 1×10^{-3} M). Experimental results show that the distribution coefficients (K_d values) of Se(IV) on the rock and mineral samples increased with the decreasing of Se(IV) concentration. The sorption of Se(IV) on biotite has the largest K_d value in low concentration area ($< 10^{-7}$ M) stabilizing between 0.0595 ± 0.0097 m³/Kg and 0.0713 ± 0.0164 m³/Kg. The K_d value of Se(IV) on K-feldspar was the second largest (0.0154 ± 0.0019 m³/Kg in 10^{-9} M) while the sorption on quartz was negligible. The sorption behavior of Se(IV) on Grimsel granodiorite followed the same trend as plagioclase, the most abundant mineral in Grimsel granodiorite, with K_d values of 0.0078 ± 0.0010 m³/Kg for Grimsel granodiorite and 0.0085 ± 0.0016 m³/Kg for plagioclase, when Se(IV) concentration was 10^{-9} M. HPLC-ICP-MS results show that all the Se(IV) re-

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