

Accepted Manuscript

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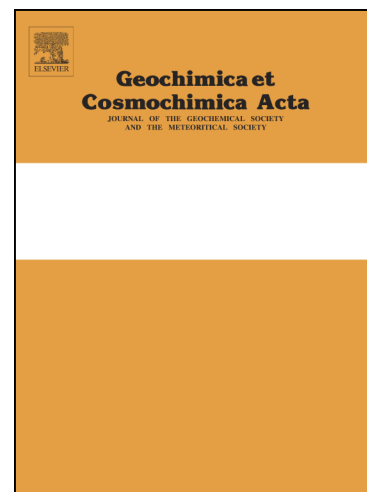
PII: S0016-7037(18)30423-X
DOI: <https://doi.org/10.1016/j.gca.2018.07.037>
Reference: GCA 10868

To appear in: *Geochimica et Cosmochimica Acta*

Received Date: 23 November 2017
Revised Date: 25 July 2018
Accepted Date: 27 July 2018

Please cite this article as: Wunderlich, A., Heipieper, H.J., Elsner, M., Einsiedl, F., Solvent stress-induced changes in membrane fatty acid composition of denitrifying bacteria reduce the extent of nitrogen stable isotope fractionation during denitrification, *Geochimica et Cosmochimica Acta* (2018), doi: <https://doi.org/10.1016/j.gca.2018.07.037>

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Solvent stress-induced changes in membrane fatty acid composition of denitrifying bacteria reduce the extent of nitrogen stable isotope fractionation during denitrification

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Abstract

Microcosm experiments with the well-studied denitrifier *Thaurera aromatica* show a link between a higher maximum membrane concentration (MMC) of the toxic organic solvents 1-octanol and 4-chlorophenol and a higher degree of saturation (DoS) of the fatty acids in the cell membrane. This coincides with less pronounced stable isotope fractionation during denitrification. We suggest that the change in cell membrane fluidity and the cell's stress response leads to a decrease in nitrate transport across the cell membrane and/or an increase in the relative ratio of respiratory nitrate reduction rate versus efflux of unreacted nitrate. Both models show that the apparent kinetic isotope effect (AKIE) approach unity and thus reduce the extent of the resulting stable isotope enrichment factor $\epsilon^{15}\text{N-NO}_3^-$ in

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