

Interactive comment on “Sulfur isotope fractionation during heterogeneous oxidation of SO₂ on mineral dust” by E. Harris et al.

Anonymous Referee #2

Received and published: 26 March 2012

This is the continuity of an ongoing, multipart project to characterize the isotopic fractionation of sulfur during oxidation of S(IV).

I have no major concerns regarding this manuscript. As mentioned by the first reviewer, it is well written, well presented and it makes sound. Beyond the remarks given by the first reviewer upon which I agree, (for instance use deplete ³⁴S instead of enriched ³²S which can easily confuse your readers) I would appreciate if the authors can also clarify the following points:

How they can be sure that 2 days of soaking has no impact on the composition of the solution? How the solution was stored? At room temp? under dark conditions etc? please clarify

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What was the pH of the leaching solution?

There is no description of any blank tests and data to control their experiments, aqueous as well as gas flow, why?

I would like to see such tests to be sure that oxidation is the result of the “dust” only

Can the authors calculate the JO₃ and JSO₂ to show clearly that no photolysis or too slow photolysis is going on?

Comparison with others studies, please compare and cite the just published Alexander paper in JGR (Alexander, B., D. J. Allman, H. M. Amos, T. D. Fairlie, J. Dachs, D. A. Hegg and R. S. Sletten (2012), Isotopic constraints on the formation pathways of sulfate aerosol in the marine boundary layer of the subtropical northeast Atlantic Ocean, J. Geophys. Res., 117(D6), D06304, doi: 10.1029/2011jd016773.)

In conclusion section, when the authors cite Harris 2012 for SO₂+OH and aqueous oxidation by H₂O₂ and O₃, please remind us what were the fractionations for these reactions so that we have a global view in one paper.

Please recheck all your referenced as most of them have confusing Volume/Issue/page Obviously the format of their bibliography software has some issues

Interactive comment on Atmos. Chem. Phys. Discuss., 12, 2303, 2012.

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