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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Year-round records of bulk and size-segregated aerosol composition in central Antarctica (Concordia site) Part 1: Fractionation of sea-salt particles" *by* Michel Legrand et al.

J. Ma (Editor)

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Dear Dr. Legrand,

My apologize for such a long time for the open discussions of your manuscript. Your manuscript did undergo an unusual experience, which is certainly unpleasant for you as well as for us. Two referees had accepted our invitation to review your manuscript in April. But both of them failed to submit their reports in early July when the open discussions should be closed normally for your manuscript. It took a few weeks more

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Discussion paper

for me to contact them and to nominate other potential referees. Although I found another two referees agreeing to review your manuscript, unfortunately the report from one referee was missing again by the initial and extended deadlines. While promising to submit the review report soon, one referee said in his/her personal email to me that the paper is good but tough to get through and it's taken longer than expected. Actually, I share the same feeling with that referee when reading your manuscript.

Now we have gotten two review reports. While both referees admire import value of your data and significance of your work, one of them rates a low value of the quality of your manuscript especially in presentation. I agree with the referee (Referee 3) in that the manuscript needs to be focused more on the analysis of chemical processes. Actually, another referee (Referee 1) also suggested that additional chemical process be considered for chlorine depletion relative to sodium with respect to freshly emitted sea salt aerosols.

I noted that the sulfate aerosol issue has been intensively addressed by a companion paper of this manuscript (Legrand et al., 2017), which was also published in ACPD. Therefore, you may refer to that paper for the filtering of biogenic sulfate aerosols and, as suggested by the referee, focus more on the ionic chemistry involved in sulfate depletion relative to sodium with respect to the composition of sea water.

I also agree with the referee in that the discussions on implications for ice core studies (Sect. 3.3) should be skipped over if these discussion help little to explain your measurement and analysis results presented in the preceding sections.

In summary, I think that your manuscript needs substantial revisions based on the comments from the referees. You are welcome to submit the revised manuscript if you think that all the issues they raised can be well addressed. Your manuscript will be sent to the referees for further review, and the final decision can be made then.

If you have any questions, please do not hesitate to contact me.

Sincerely,

Jianzhong Ma

Reference: Legrand, M., Preunkert, S., Weller, R., Zipf, L., Elsässer, C., Merchel, S., Rugel, G., and Wagenbach, D.: Year-round record of bulk and size-segregated aerosol composition in central Antarctica (Concordia site) Part 2: Biogenic sulfur (sulfate and methanesulfonate) aerosol, Atmos. Chem. Phys. Discuss., 2017, 1-39, 10.5194/acp-2017-305, 2017.

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