

Interactive comment on “Impact of organic acids on chloride depletion of inland transported sea spray aerosols” by Bojiang Su et al.

Anonymous Referee #2

Received and published: 16 July 2020

The manuscript presented the chemical composition of individual sea salt aerosol particles (SSA) using a single particle aerosol mass spectrometer (SPAMS). About 50,000 SSA from 2 million detected particles were identified. These SSA were classified as SSA-aged, SSA-bio, and SSA-Ca. The manuscript showed positive correlations between Na and organic acids. Thus, the authors claimed that organic acids played significant role in the chloride depletion, then up to 34% of depletion was estimated. It also claims that SSA-bio particles can be assigned as the biological origin. This study provides additional data sets for the better understanding in the atmospheric processes of sea salt aerosol. Some of the conclusions need clarifications before it can be considered for publication.

Comments:

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Line 22, 321-323. Please clarify which part of the SSA-bio particles are biological origin? Do you mean the SSA part in SSA-bio particles, like [Na] detected in the mass spec. are these components also biological origin? If so, is there any previous studies showing that biological sources produces SSA-like particles or components? If not, that means among SSA, half of them are sea salt aerosol (likely from sea spray) mixed with biological components during the transport, then current statement is misleading and not accurate.

Line 23, 36-41, 251-252, 308-309. It is not clear how these conclusions were reached. Line 251-252, it claims organic acids contributed about 2-34% chloride depletion in SSA-aged, and 2-39% in SSA-bio particles. Where do these numbers come from? Are these estimates based on SPAMS or bulk measurements as showing in Line 270-276? In Fig.S5, organic acids only contribute less the 20% of all acids. In Fig. 4 and Fig. 5, how can readers relate peak area of Cl/Na to the chloride depletion? For pure NaCl particles, what is the value of peak area of Cl/Na, if it is plotted in Fig.4/5?

Line 288-291, the relation/trend shown in Fig. 5 does not mean that they are “direct evidence”.

Line 270-276, please provide details for the bulk measurements.

In the main text, please define “hourly mean peak area” in Figure 2 and “peak area of Cl/Na” (do you mean ratio of peak area of Cl to peak area of Na in y axis?) in Figure 4 and 5.

Figure 3, what are the standard deviations in these numbers?

Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2020-443>, 2020.

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