

General.

We would like to appreciate the editor for providing the valuable comments. We have revised our manuscript by fully taking the editor's comments into account. Responses to specific comments raised by the editor and reviewers are described below.

1.) Abstract, Line 27: Change "atmosphere" to "atmospheres"

Response: Revisions have been made in the revised manuscript (Line 27).

2.) Line 34: Change "excepting" to "except for"

Response: Revisions have been made in the revised manuscript (Line 34).

3.) Abstract, Line 45: Change "process" to "processes"

Response: Revisions have been made in the revised manuscript (Lines 45).

4.) Line 54: Change "light-absorbing" to "light-absorbing properties"

Response: Revisions have been made in the revised manuscript (Line 54).

5.) Line 71: Change "Riva et al., (Riva et al. 2015)" to "Riva et al. (2016b)"

Response: Revisions have been made in the revised manuscript (Line 71).

6.) Lines 78-80: Please affiliate the exact studies you cite to the particular area (e.g., suburban, rural, urban, marine, polar, or forest) they studied. This will help readers more easily know which studies correspond to suburban, rural, urban, marine, polar and forested areas. The authors should also include citing studies by Inuma et al. (2007, ES&T), Surratt et al. (2007, ES&T), Budisulistiorini et al. (2015, ACP), Rattanavaraha et al. (2016,

ACP), and Chen et al. (2021, ACS Earth and Space Chemistry, <https://doi.org/10.1021/acsearthspacechem.1c00102>). The latter study by Chen et al. investigated organosulfates across the IMPROVE Network of the U.S.

Response: The references mentioned above have been added in the revised manuscript (Lines 78–83).

7.) Line 111: Can you add a parenthetical statement after "dense population" to say how many people exactly lived in Shanghai at the time of sampling?

Response: ...dense population (~1.12 million people in Xuhui district)...(Line 114)

8.) I noticed the authors never directly addressed the potential artifacts of using quartz fiber filters without the use of carbonate denuders. This issue was brought up by two studies, including Brüggemann et al. (2021, ES&T Letters) that showed without denuding SO₂ filters can uptake SO₂ to unintentionally form OSs as a positive artifact. The other study by Kristensen et al. (2016, Atmos. Environ.) also demonstrated that OSs can form on filters without properly scrubbing the gas-phase SO₂ or Nox. Can the authors at LEAST acknowledge this positive artifact could be happening in their analyses, and such, should be carefully dealt with in future studies to determine EXACT quantities of OSs/NOSs?

Response: Revisions have been made in the revised manuscript (Lines 124–132).

Lines 124–132: It should be pointed out that the concentrations of detected OSs could be impacted by the sampling process without denuding SO₂ (Kristensen et al. 2016; Brüggemann et al. 2021). However, if SO₂ can heterogeneously react with organic species

on filters to form OSs, these processes should also occur on ambient particle matter before the sample was collected. Thus, we did not consider the potential impact of PM_{2.5} collection without denuding SO₂ on OS measurements in this study. In the future, the relative importance of the heterogeneous sulfation reactions on filter and ambient particle matter should be further evaluated for different environments.

9.) Lines 223-228: The authors here should also cite important prior work than those cited here by Lin et al. (2013, ACP), Budisulistiorini et al. (2015, ACP), and Rattanavarha et al. (2016, ACP). These studies showed early on that OSi were the dominant components of OSs found in PM from the southeastern US., including urban (Rattanavaraha et al., 2016, ACP) and downwind forested areas (Lin et al., 2013, ACP; Budisulistiorini et al., 2015, ACP).

Response: The references mentioned above have been added in the revised manuscript (Lines 234–240).

10.) Lines 238-240: I encourage these authors to also include work by Lin et al. (2013, ACP), Budisulistiorini et al. (2015, ACP), Rattanavarha et al. (2016, ACP), Cui et al. (2018, ESPI), and Chen et al. (2021, ACS Earth and Space Chem) in these discussions as they also provided important quantitative data of OSs in PM_{2.5} collected in the U.S.

Response: The references mentioned above have been added in the revised manuscript (Lines 256–262).

11.) Lines 257-267: strongly encourage the authors to make reference to at least

Budisulistiorini et al. (2015, ACP), Rattanavarha et al. (2016, ACP), Cui et al. (2018, ESPI) and Chen et al. (2021, ACS Earth and Space Chem) for contributions of total quantified OSs to total OM in PM_{2.5}. These results support some of the other studies cited here.

Response: The references mentioned above have been added in the revised manuscript (Lines 276–284).

At last, we deeply appreciate the time and effort you've spent in reviewing our manuscript.