

Atmos. Chem. Phys. Discuss., referee comment RC4  
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## Comment on acp-2021-1069

Anonymous Referee #4

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Referee comment on "Molecular characteristics, sources, and formation pathways of organosulfur compounds in ambient aerosol in Guangzhou, South China" by Hongxing Jiang et al., Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2021-1069-RC4>, 2022

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The manuscript by Jiang et al. presents new and interesting research on organosulfur compounds in atmospheric aerosols in Guangzhou, China. The results are generally well presented, but there are also several, major issues which must be corrected in order to improve the quality of the manuscript to the level expected for publication in ACP. As there are already three reviews posted I will focus on the major comments here.

Language and grammar need significant improvement by a person with good knowledge of English and science in the field. There are numerous language errors beyond what can be expected of reviewers to fix. The manuscript will need additional review after this editing.

The title does not adequately reflect the conclusions of the work. First of all "aerosols" should be mentioned in the title. Secondly (as already pointed out by another reviewer) the results show that there are a range of sources and processes. The results and discussion in section 3.4 is not convincing enough to warrant stating that "Heterogenous secondary reactions drivers the molecular distribution". Section 3.4 also mentions the word "speculation" several times. This uncertainty should be reflected in the title.

Please use correct chemical nomenclature throughout the manuscript for e.g. compounds (SO<sub>2</sub> with lowercase 2 and so on).

The abstract needs considerable editing of language and grammar. Please avoid using the non-specific word "various" and be more precise.

L27: In my opinion this sentence is not adequately supported by the results of the study.

Line 38-39: A reference is needed for stability and lifetime of OrgSs.

Line 62. What are classical Oss?

Line 83-84: This is not clearly shown in the study and the sentence should be rephrased.

Section 2.1: Please add more information about the sampling including type of area (urban background?), sampling (type of sampler, filters, frequency and length of sampling time). Furthermore it would be nice to have just a short description in the main manuscript about the extraction method. It would also be nice to have some meteorological parameters for the area for the sampling periods (T, RH), maybe in SI.

Line 97: This sentence is unclear.

Line 138: Please provide standard deviations for all averages in the text.

line 157: please give a reference to the last part of the sentence.

Line 171: it is quite surprising that sulfonates were not detected.

Figure 1: It is not clear what the circles in 1.a represents.

The x-axis in 1.c must be improved as there are only a few samples per month. It should be clear which sample is shown.

L208-210: How can C7 compounds be derived from isoprene?

L213-215: Even though dimeric oxidation products are very interesting, they are also found at very low levels in the atmosphere, so their contribution to organic sulfur compounds is expected to be small.

L241-243: This sentence does not add valuable information and I suggest to delete.

L247: Figure S2a – you probably mean Figure 2a.

L254-257. this sentence is not clear.

Figure 2: Figure 2a is very busy and difficult to read. I suggest to make it more clear and: not use yellow, correct typos (hevay -> heavy, vheicle -> vehicle. Figure text: filed -> field.

L290: PAHs are precursors of aromatic OSs, but they are found at low levels, so “important” could be removed here.

L301:  $R^2$  of 0.19 represents a small correlation despite the p-value.

L325: Suggest to rephrase to: “Acid-catalyzed reactions of epoxides formed by oxidation of VOCs...” Please add a reference as well to the original work on this.

The methodology and interpretation of Figure 4 needs further explanation. Figure 4 shows that organosulfur compounds are distributed in all directions in the plot pointing to complex sources and processes.

L432: Do you mean oxidation of VOCs in the presence of  $\text{NO}_2$ ?