



EGUsphere, referee comment RC2
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Comment on egusphere-2022-838

Anonymous Referee #2

Referee comment on "Chemical characterization of organic compounds involved in iodine-initiated new particle formation from coastal macroalgal emission" by Yibei Wan et al., EGU sphere, <https://doi.org/10.5194/egusphere-2022-838-RC2>, 2022

The authors reported the chemical composition and evolution of volatile precursors emitted from macro-algae and their oxidation products in the gas and particle phase using a suite of mass spectrometers. But it was shallow and simple about the discussion of the transformation mechanisms of organic compound. I recommend that the authors could make more detailed explanations about the results and explore more precise reaction formulas.

Here are some questions about the methods and results in the following.

Method

81: "In the three ozonolysis experiments"

It seems that only one result (without error bar) is shown in this paper. What is about the remaining two experiments?

84: "In an additional OH-enhanced experiment"

The authors conducted this experiment for simulating atmospheric oxidation process, however, you didn't even give the concentration of additional OH and the limitation of the experimental design compared with the real environment wasn't discussed.

120: "TI or TOC in the particles was obtained by subtracting the amount on the back filter from that on the front filter"

I am confused about the calculation. As you said that "The front filter of the double filter pack collected the particles, while the back filter placed downstream of the front filter was supposed to adsorb the same amount of volatile species as the front filter", may I think of it this way: particles in the front filter and volatile species in the back filter. Why the TI in the particle is not the amount on the front filter? Why it needs to subtracting the amount on the back filter?

128: "Only the compounds that existed solely in the front filter or with ion intensity in the front filter higher than that in the back filter by a factor of 3 were regarded as the organic compounds in the particle phase"

Please cite suitable literature.

Results and discussion

135, 138: "new particles larger than 14 nm were observed only 58 minutes after the injection of ozone flow", "With a prolonged residential time of 67 min..."

The authors talked about the results after 58 or 67 minutes. But the maximum of axis about the elapsed time in the Figure. 2 was 50.

136: "No particles were formed in the absence of room light or ozone".

I don't see the relevant results (table or figure) shown in the paper.

154: "But those small new particles are expected to grow into CCN active sizes, given longer residence time and uptake of more condensing vapors in the atmosphere".

Please cite suitable literature.

156: "3.2 Macroalgal emission"

I think it is more suitable to remove this section to the first part of the **Results and discussion**

187, 188: "IO, IO₂ and ClIO could be from the reactions between I, ClI and O₃", "ClNO₂ was likely to form upon similar reaction between Cl and NO₂ in the bag reactor"

Give the reaction mechanisms or cite literatures.

195: "which is contrary to the observation by HPLC-ICP-MS that total iodine was mostly dominated IO₃⁻ peak"

Could the authors explain the contrast?

259: Scheme II

The formulas are too simple to understand the mechanism of particle formation. It might be meaningful to give formulas like Scheme I for several specific species.