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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Molecular Composition and Photochemical Evolution of Water Soluble Organic Carbon (WSOC) Extracted from Field Biomass Burning Aerosols using High Resolution Mass Spectrometry" *by* Jing Cai et al.

Anonymous Referee #2

Received and published: 22 December 2019

This is an interesting manuscript that describes photo-oxidation of both representative "real" biomass burning organic aerosol (straw) as well as a simpler surrogate containing

I find the paper hard to follow. This is in part because the written English, while passable, is imperfect. However, the main issue is that there is no clear story beyond "oxidation of WSOC increases the oxidation state" (which is almost guaranteed) and "even a model system from a single fuel is very complex".

As far as I can tell a manuscript with a more clearly articulated story would be appropriate for ACP, but I am also on the edge of the subject area, and so a reviewer with greater experience with high-resolution GC methods might be more appropriate.

Some general comments:

The "/" in "O/C" really means ratio, so "O/C ratio" is redundant. I suggest writing "the oxygen to carbon ratio (O/C)" once and then omitting "ratio" when subsequently using the abbreviation. There is room in the literature for complex analyses of complex systems and we can not always demand an incredibly simple story, but the paper could still benefit from a major re-write to pull the most important themes to the surface.

I do not believe it is appropriate to end the abstract with "accounting for the highly oxygenated nature". Perhaps "contributing to" is warranted but the implication of the current wording is that the contribution dominates, and that has not been demonstrated here.

Specific comments:

Line 252 "is prone for" is not quite right. "is most sensitive to molecules containing polar ..."?

Line 287 "the all extract samples" ???? Either the authors actually mean "the all-extract samples" or they may mean "all of the extracted samples". Clarify.

Line 290 "the emerged O/C ratios" could be "the measured O/C values" ("values" is appropriate after O/C in my opinion).

Line 336 "as well as to increased" clashes with the subject "would result in" before, so "to" should be "in".

Line 347 "pathway for the low-volatility" strike "the".

Line 532 "experience the similar" again strike "the".

Line 543 "aerosols have the potential" the subject is "fraction" so should be "has".

Line 544 "partly account for" is better than the abstract but "contribute to" would be best in both places.

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