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Atmospheric Chemistry and Physics Discussions

# *Interactive comment on* "Biogenic, urban, and wildfire influences on the molecular composition of dissolved organic compounds in cloud water" *by* Ryan D. Cook et al.

**Anonymous Referee #1**

Received and published: 25 August 2017

General comments This study reports the molecular composition of cloud water collected under urban, biogenic, and biomass burning influences revealing key differences among dissolved organic compounds in each condition. The results are clearly presented, concise, and contain sufficient detail. I have only minor suggestions for strengthening this work. Upon revision, I would recommend that the editor accept this manuscript.

Specific comments

Abstract: The abstract would benefit from a concluding sentence in the abstract that draws the reader's attention to the most significant findings of this work, or to the larger



takeaway from the measurements.

Pg 4 Line 4: What were TOC concentrations before the concentration step? Since there was a concentration step, it's not clear what giving these values tells the reader, except that the concentrated samples were probably above LOD for most techniques. Even an estimate of the increase (doubled, 10-fold) would be useful here. Line 11: Why negative ion mode? I'd think that you would miss any ammonium-based oligomers including imines. Negative ion mode captures acids well, but not reduced nitrogen compounds. Could the authors at least comment on this point here?

Pg 8 Lines 16-17: I'm not sure the data support the claim that acidity (as opposed to BB-specific VOCs, their concentration, or pyrolysis itself) is responsible for the increase in oligomeric material. It's certainly possible, but it's also possible that the BB cloud water simply had lower pH AND more oligomeric compounds. Higher concentrations of the same compounds could facilitate increased oligomerization too, right? Please revise to avoid overstating the connection.

Technical corrections Pg 1 Line 26: "with a focus" Line 31: "was positively correlated"

Pg 2 Line 4: "water soluble organic gases" so as to distinguish SO2 from the organic compounds alluded to here Line 6: "depending on their solubility" for concision

Pg 4 Line 5: "including some organosulfate" right? Not all? I believe organosulfates are reported here.

Pg 5 Line 6: "compose" not comprise

Pg 9 Line 12: "succinic acid based"

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