

Interactive comment on “Organic composition of carbonaceous aerosols in an aged prescribed fire plume” by B. Yan et al.

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Organic composition of carbonaceous aerosols in an aged prescribed fire plume By B. Yan, M. Zheng, Y. T. Hu, S. Lee, H. K. Kim, and A. G. Russell

General Comments:

This manuscript describes a study of organic pollutants from a prescribed fire (dominated by conifers) impacted Atlanta, GA on 28 February 2007. The results of this study showed dramatically increased hourly ambient concentrations of PM_{2.5} and organic carbon (OC). To better understand the processes impacting the aging of fire plumes, the authors conducted a detailed chemical speciation of carbonaceous aerosols by

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gas chromatography/ mass spectrometry (GC/MS) analysis. Ambient concentrations of many organic species (levoglucosan, resin acids, retene, n-alkanes, n-alkanoic acids) associated with wood burning emission were significantly elevated on the event day. The study also demonstrated that large quantities of biogenic volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs) were released both as products of combustion and unburned vegetation heated by the fire. Elevated ambient concentrations of 20 secondary organic tracers (dicarboxylic acids, 2-methyltetrols, pinonic acid and pinic acid) were also observed.

The paper is very well written and generally easy to follow. I have a few issues that I would like to see addressed, most of which relate to methodological aspects of the paper that affect the robustness of the data interpretation, which I outline below:

P7, L17; what was the basis for using a multiplication factor of 1.4 to convert measured carbon to OC? Shouldn't the high content of biogenic and other polar organics drive this factor considerably higher than 1.4, as shown by other similar studies cited by the authors?

P20, Lines 4-7; are CO₂ data available in that area? CO₂ concentrations are excellent tracers of the prevailing atmospheric dilution conditions and would put several statements made in this section into the right perspective and eliminate any of the vagueness.

P11, L5-7; there is increased secondary organic formation in Atlanta in February? Can this argument be supported by either meteorological or atmospheric (O₃ etc) data

P13, L19; "factions" or "fractions"

General Comments

- 1) Does the paper address relevant scientific questions within the scope of ACP? YES
- 2) Does the paper present novel concepts, ideas, tools, or data? YES

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- 3) Are substantial conclusions reached? YES
- 4) Are the scientific methods and assumptions valid and clearly outlined? YES
- 5) Are the results sufficient to support the interpretations and conclusions? YES
- 6) Is the description of experiments and calculations sufficiently complete and precise to allow their reproduction by fellow scientists (traceability of results)? YES
- 7) Do the authors give proper credit to related work and clearly indicate their own new/original contribution? YES
- 8) Does the title clearly reflect the contents of the paper? YES
- 9) Does the abstract provide a concise and complete summary? YES
- 10) Is the overall presentation well structured and clear? YES
- 11) Is the language fluent and precise? YES
- 12) Are mathematical formulae, symbols, abbreviations, and units correctly defined and used? YES
- 13) Should any parts of the paper (text, formulae, figures, tables) be clarified, reduced, combined, or eliminated? NO
- 14) Are the number and quality of references appropriate? YES
- 15) Is the amount and quality of supplementary material appropriate? N/A

Interactive comment on Atmos. Chem. Phys. Discuss., 7, 18015, 2007.

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