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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Characterization of biomass burning smoke from cooking fires, peat, crop residue and other fuels with high resolution proton-transfer-reaction time-of-flight mass spectrometry" *by* C. E. Stockwell et al.

Anonymous Referee #2

Received and published: 16 November 2014

This paper presents results from the measurements of gas-phase non-methane organic compounds (NMOC) in smoke from the burning of different types of fuel. These experiments were conducted at the Fire Science Lab in Missoula, MT during the FLAME-4 Study. The gases were measured using a proton-transfer-reaction time-of-flight mass spectrometer (PTR-TOF-MS). This data was used to report many rarely measured or previously unidentified gas-phase emissions from the burning of these different types of fuel. Newly updated biomass burning emission factors (EFs) are presented and discussed.

Biomass burning is known to be the second largest source of NMOC. However, a significant portion of NMOC still remains unidentified. This paper is working towards trying to close this gap. Additionally, this paper provides new improved emissions factors that can be used for modeling biomass burning emissions. Many in the atmospheric community would be interested in this paper.

Overall, this is a good paper. It is well written and very easy to follow. The methods employed seem scientifically sound. I really just have a handful of small comments to help with the flow of the paper. These are outlined below and need to be addressed before the paper can be considered for publication.

General Comment: -The order of the references in the citations seems to vary through the paper of being in alphabetical or chronological order. Either way is actually fine, but it should be consistent throughout. I have tried to point out the ones I noticed below in my specific comments.

Specific Comments: Abstract Page 22165, Line 3 – There should be no hyphen between crop and residue

Page 22165, Line 5 – Suggest changing standards to standard

Page 22615, Line 10 – The abbreviation FTIR has not been defined

Introduction Page 22166, Lines 7-9 – The references are not in chronological order

Page 22166, Lines 23-24 – There should be hyphens in proton transfer reactions

2.3.Proton-transfer-reaction time-of-flight mass spectrometer Page 22171, Line 8 – The abbreviation VOC has not been defined

2.4.OP-FTIR Page 22171, Line 10 – The chemical formula used has not been defined

3.Results 3.1.Peak assignment Page 22174, Line 10 - The references are not in chronological order

Page 22174, Line 19 - The references are not in chronological order

Page 22714, Line 25 - The references are not in chronological order

4.Discussions 4.1.Aromatic hydrocarbons Page 22177, Lines 11-12 - The references are not in chronological order

Page 22177, Line 21 - The references are not in chronological order

4.2.Phenolic Compounds Page 22180, Lines 5-6 - The references are not in chronological order

Page 22180, Lines 12-13 - The references are not in chronological order

Page 22180, Lines 15-16 - The references are not in chronological order

4.3.Furans Page 22181, Lines 5-6 - The references are not in chronological order

4.4.Nitrogen-containing compounds Page 22181, Lines 21-22 - The references are not in chronological order

4.5.Sulfur, phosphorous, and chlorine-containing compounds Page 22184, Line 7 - The references are not in chronological order

4.6.Miscellaneous (order of increasing m/z) Page 22185, Line 11 - The references are not in chronological order

Page 22185, Line 17 – There should be no hyphen between crop and residue

Page 22186, Lines 11-12 - The references are not in chronological order

Page 22187, Line 10 - The references are not in chronological order

4.7.Cookstoves Page 22187, Line 18 – Envirofit is misspelled

References Page 22912, Line 6 – Believe it should be St. Clair, J.M.

Page 22912, line 27 – There is an extra d at the end of European

Page 22195, Line 8 – There should be an and before Hjorth

Page 22199, Line 29 – There should be an and before Fanelli

Tables Table 2 -Line 2 of the caption - Suggest adding the word type after fuel

Figures Figure 1 -Suggest labeling each plot as a, b, or c since they are referred to this way in the text

Figure 3 -Suggest indicating in the caption that the number of oxygen atoms for the three various oxygenated classes are indicated in parenthesis in the legend

Figure 5 -Line 3 of the caption - Suggest changing considered the fuel average to considered in the fuel average

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Interactive comment on Atmos. Chem. Phys. Discuss., 14, 22163, 2014.