

Interactive comment on “Non-methane organic gas emissions from biomass burning: identification, quantification, and emission factors from PTR-ToF during the FIREX 2016 laboratory experiment” by Abigail R. Koss et al.

Anonymous Referee #1

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This paper describes the identification of non-methane organic gases (NMOGs) measured by PTR-ToF mass spectrometry of biomass burning emissions during the 2016 FIREX experiment at the Missoula Fire lab. The emissions of the identified species are quantified and emission ratios and factors for the different species are derived. The measurements for individual organic gases are also compared with simultaneous measurements using other techniques, such as chemical ionization mass spectrometry (using I⁻ and NO⁺) and infrared and UV spectroscopy. The authors find that while non-aromatic oxygenated compounds are the most abundant of the identified species,

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furans and aromatics comprise a large portion of the OH reactivity of the fresh emissions.

This is a well-executed study on an important topic in atmospheric chemistry, as the amount of O₃ and SOA attributable to fires is still highly uncertain, in part because of uncertainties in the emissions of NMOGs. In addition, the paper and the supplemental data go into a high level of detail on the measurements, calibrations, and subsequent calculations, making it very clear what was done, what assumptions were made, and the level of certainty for each of the provided values. The manuscript was also remarkably free of typos and other errors. I recommend publication after very minor revisions to address the few issues I noticed, listed below.

L183: What does the acronym “PLOT” mean here?

L185: Who was the manufacturer of the “MXT-624” column? I’m assuming that’s a catalogue number for some specific manufacturer?

L327: How does the disagreement in identification discussed here potentially affect current review values of biomass burning emission factors?

L327 and elsewhere: Please refer to the tab of Table S1 you are referring to, or make each tab of the Excel spreadsheet its own table number (e.g., Table S1, S2, ... or Table S1a, S1b, ...)

L420: This reference to Table 1 is probably redundant at this point.

L445-447: My understanding is that the FTIR uncertainty in HONO is also very high, around 10 ppbv. Is this correct, and if so, does that affect the use of the FTIR to determine the PTR-ToF level of detection?

L457-459: Can you discuss how the slopes and correlation coefficients change for one example species if these near-detection-limit values are excluded?

L515, Eq. 2: You need to define what the delta symbol means here, or above in Eq. 1

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Table 1: Why is the GC-CIMS measurement “qualitative only”? And why is there no reference?

Figures S4 and S5 are not referenced in the main text

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