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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Polar organic marker compounds in atmospheric aerosols during the LBA-SMOCC 2002 biomass burning experiment in Rondônia, Brazil: sources and source processes, time series, diel variations and size distributions" *by* M. Claeys et al.

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We thank anonymous reviewer #2 for useful comments which helped to improve our manuscript. Our responses to the specific comments raised by the reviewer are as follows:

ABSTRACT: The abstract is far too detailed and the important findings from the paper are lost in the sheer length of this section.

Re: An effort will be made to shorten the abstract.

EXPERIMENTAL: Note explicitly the ionization mode use.

Re: The ionization mode was electron ionization and will be mentioned in the revised manuscript.

RESULTS AND DISCUSSION: Figure 1 might be more useful, if representative chromatograms from each of the three seasons were to be shown.

Re: We can concur with this comment but unfortunately we cannot provide these figures. To prepare a clear informative Figure 1, only showing the compounds that are actually in the sample, we performed a GC/MS analysis without adding internal recovery standards, and this was only done for a sample from the transition period.

What stages of the MOUDI showed the largest PM masses?

Re: For this we refer to the Figures 4, 5, and 6 (which will be combined into one figure in the revised manuscript), which clearly show the stages with the largest PM masses.

How much PM mass was typically required to be above the level of detection for the tracers for each stage of the MOUDI.

Re: We used half or one quarter of the aluminum foils; the PM mass per whole aluminum foil varied a lot, it varied from 13 to 580 μg for the various foils of the sample shown in Fig. 4b and from 6 to 180 μg for the various foils of the sample shown in Fig. 6. However, please note that in order to perform sensitive analysis, selected ion monitoring, a very sensitive mode of detection, was used.

Additional environmental information including average atmospheric levels of NOx, SO2, and temperature would be useful or a reference to these values, if available.

Re: Relevant meteorological information (including temperature) for the LBA-SMOCC 2002 biomass burning experiment in Rondônia, Brazil, can be found in the overview article by Fuzzi et al., as mentioned in part 2.1 (Site description). The temperature

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showed little variability during the period considered, with monthly mean values around 25.0 °C, although there was a variation in the daily maximum temperature span: 10.7 °C in September, 9.4 °C in October and 8.0 °C in November. This more detailed temperature information will be included in the revised manuscript. With regard to atmospheric levels of SO2, we have referred to the study by Trebs et al. (2004) and stated (page 10902 – line 23) "It is noted that during the LBA-SMOCC 2002 experiment the mixing ratios of the acidic trace gases HNO3 and SO2 were considerably higher during the dry and transition periods than the wet period, and that the same trends were found for aerosol NO3− and SO2−4 anions showing maxima of 1.25 ppb and 0.6 ppb, respectively." For more details on the SO2 levels we want to refer to the study of Trebs et al. (2004). With regard to atmospheric levels of NOx during the campaign we refer to Trebs et al. (2006), who reported median NOx mixing ratios in the dry, transition and wet periods of 4.6 ppb, 3.0 ppb and 0.9 ppb, respectively. It is very well possible that the 2-methyltetrol concentrations are also affected by the NOx concentration since NOx is known to be involved in the formation of the 2-methyltetrols (Sato, 2008; Szmigielski et al., 2010). This additional discussion will be added in the revised manuscript.

On p.10900, line 29, replace the "intense" with "dominant".

Re: This will be corrected.

From the field data, is there any way to test the supposition of Hoffmann et al. 2010 regarding heterogeneous reactions of levoglucosan?

Re: We do not see very well how the supposition of Hoffmann et al. (2010) can be supported through field data, considering that the burning conditions are very dependant on the time of the day, i.e., flaming combustion during daytime versus smoldering combustion during nighttime, and that flaming combustion is in itself a highly oxidative process.

As a guide to the reader, provide approximate carbon numbers or vapor pressures in referring to semivolatile carboxylic acids.

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Re: Approximate carbon numbers (Cn; n$\leq$ 6) will be provided for the semi-volatile carboxylic acids in the revised manuscript.

In the Decesari et al., 2006 reference, Rondonia is misspelled.

Re: This will be corrected.

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 10889, 2010.