Atmos. Meas. Tech. Discuss., 4, C2345–C2348, 2011
www.atmos-meas-tech-discuss.net/4/C2345/2011/

Atmospheric Measurement Techniques Discussions

Interactive comment on "Quantification of levoglucosan and its isomers by High Performance Liquid Chromatography – Electrospray Ionization tandem Mass Spectrometry and its applications to atmospheric and soil samples" *by* C. Piot et al.

C. Piot et al.

christine.piot@lgge.obs.ujf-grenoble.fr

Received and published: 12 December 2011

We thank the reviewer for their relevant comments, which were all taken into consideration in the corrected manuscript (indicated in blue color).

Responses to referee comments are detailed below and cited after the referee comments.

General comment: comparison of mannosan and galactosan measurements

We agree with the reviewer that such comparison would be of major interest. Nevertheless so far we have to admit that we cannot provide more than few points of comparison with a too low statistics. This can be explained by the fact that when concentrations of the isomers could be higher than the detection limit (ie in winter for instance), then levoglucosan concentrations were extremely high and required a dilution of the solution to be in the proper analytical range (20-200 μg.L-1) and thus brought the isomers below the LOQ. We focused our comparison on levoglucosan, the most present monosaccharide anhydrides. Intercomparison of mannosan and galactosan analyzed by LC-MS with other methods will be performed in other environments as part of the European levoglucosan intercomparison.

Specific comments

1. Page 4542, lines 1-4: The references listed here are not correctly cited, i.e., they deal not with the full year (but with winter) or not with OA (but instead with OC). While Caseiro et al. (2009) deals with the full year, it does not deal with OA but with OC; Yttri et al. (2009), Zdráhal et al. (2002), and Szidat et al. (2006) all deal with winter and OC; finally, Favez et al. (2010) does deal with OA, but during winter.

It was reorganized in the corrected manuscript page 2 lines 13-17.

2. Page 4542, line 13: Stating that the 3 anhydrosugars are formed during pyrolysis of cellulose is inaccurate. According to Caseiro et al. (2010), "Levoglucosan derives from the D-glucose units of the holocellulose molecules (cellulose and hemicelluloses) when those undergo a pyrolysis process (Shafizadeh, 1968, 1984). The less investigated anhydrosugars mannosan and galactosan evolve in a similar way but from the mannose and galactose units of the biofuel's hemicellulose molecules (Otto et al., 2006)".

More details were added in this regard in the corrected manuscript page 2 line 26.

3. Page 4542, line 16: In recent years the atmospheric stability of levoglucosan has

AMTD

4, C2345–C2348, 2011

been somewhat questioned, i.e., by Hoffmann et al. (2010) and by Hennigan et al. (2010). A word of caution on the stability would thus we welcome.

It was taken into account in the corrected manuscript, in the phrase page 2 line 32 to page 3 line 4: “Recently, Hoffman et al. (2010) nevertheless pointed out the potential oxidation of levoglucosan by OH radicals in the aqueous phase of aerosols. Moreover, Hennigan et al. (2010) estimated a loss of levoglucosan between 20 and 90% during smoke plume aging in typical summer conditions. These results should be carefully considered for aged air masses and taken into account when using this tracer for biomass burning apportionment.”

4. Page 4543, line 23, page 4547, lines 26-27, and possibly also elsewhere: References in parentheses should be placed in chronological order.

It was reordered in the corrected manuscript.

5. Page 4543, line 24: The authors claim here that their LC-MS method is a "new" method. However, on page, 4543, lines 13-14, they mention that Palma et al. (2004) already used HPLC in combination with ESI-MS/MS for measuring levoglucosan. To which extent is the authors’ method then "new"?

This paragraph was rewritten in order to emphasize better the novelty of our method page 3 line 25-page 5 line 5.

6. Page 4544, lines 22-25: Although the diameter of the filter is mentioned later in the manuscript, it should (also) already be mentioned here.

The diameter was mentioned again in page 5 line 3.

7. Page 4545, line 3: "Favez, 2010" is not in the reference list whereas "Favez et al., 2010" is there. Should it perhaps be "Favez et al., 2010" here? "El Haddad, 2011" is not in the reference list.

It was taken into consideration in the corrected manuscript.

AMTD

4, C2345–C2348, 2011

8. Grammatical and other technical corrections: p. 4542, l. 2, and p. 4556, l. 4: replace "Zdrahal" by "Zdráhal". p. 4542, l. 18: replace "Hornig, 1985" by "Hornig et al., 1985". p. 4545, l. 18: replace "Gelmann" by "Gelman". p. 4545, l. 19: replace "samples extract" by "sample extract". p. 4549, l. 22: replace "compounds analysis" by "compound analysis". p. 4551, l. 4: replace "matrixes" by "matrices". p. 4553, l. 19: replace "Environ. Science Technol." by "Environ. Sci. Technol.". p. 4554, l. 16: replace "561-568 pp." by "pp. 561-568". p. 4554, l. 22; replace "Simoni, E. d." by "De Simoni, E.". p. 4554, l. 30: replace "European Atmospheric Conference" by "European Aerosol Conference" p. 4555, l. 6: This line should be adjusted to the left. p. 4555, l. 21: replace "v Simoneit" by "Simoneit".

They were all taken into consideration in the corrected manuscript.

Please also note the supplement to this comment:
http://www.atmos-meas-tech-discuss.net/4/C2345/2011/amtd-4-C2345-2011-supplement.pdf

---

Interactive comment on Atmos. Meas. Tech. Discuss., 4, 4539, 2011.