Atmos. Chem. Phys. Discuss., 12, C9436–C9439, 2012
www.atmos-chem-phys-discuss.net/12/C9436/2012/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Chemical characterization and stable carbon isotopic composition of particulate polycyclic aromatic hydrocarbons issued from combustion of 10 Mediterranean woods" *by* A. Guillon et al.

A. Guillon et al.

e.villenave@epoc.u-bordeaux1.fr

Received and published: 16 November 2012

Dear Referee 1,

Please find below the answers of your questions and comments to be considered for the submission of our revised manuscript to Atmospheric Chemistry and Physics:

Journal: ACP Title: Chemical characterization and stable carbon isotopic composition of particulate Polycyclic Aromatic Hydrocarbons issued from combustion of 10 Mediterranean woods. Author(s): A. GUILLON, K. LE MENACH, P.-M. FLAUD, N.

MARCHAND, H. BUDZINSKI, E. VILLENAVE MS No.: acp-2012-409 (Research Article)

We noticed that you find the subject of the paper very topical and that you think that isotopic signatures of some markers can be further employed in analyses of ambient samples to track back sources of the measured aerosol. As you already noted that the paper was suitable to be published in the journal, after correcting some major and minor points, you will be happy to see that all of them have been taken into account (as detailed below).

Thanking you for your help in improving our article,

Best wishes,

Prof. Eric VILLENAVE

****

Answers to Referee 1.

Page 20635 – Lines 1 to 3: Yes. A reference describing the combustion facility has been added in the text and in the "Reference Section".

Page 20637 – Line 1: OK. Certified and reference values from NIST are improved on a 10-15 year basis, depending on new methodologies and techniques available to extract and/or characterize the same particle samples. Here, we made the choice to use softer extraction conditions as we used two types of ASE set-ups (200 and 350). The first one was used in the same conditions as those from NIST (with excellent recovery yields) while the new set-up, more powerful, was used in softer conditions (P and T) to obtain the same excellent certified and reference values. This has been added in the new version of the manuscript for a better clarity.

Page 20637 Line 13: OK. Details on the internal standard mixture preparation (i.e. 2 μg/g of deuterated PAH crystals dissolved in isooctane) have been now added in the

new version of the manuscript (page 20637).

Page 20642 Lines 11 to 27, Page 20643 and Page 20644 Lines 1 to 6:

First part: OK. The methodologies developed in this work were validated on model particles: PAH bounded silica particles were extracted by PFE; extracts were purified using HPLC fractionation and injected in GC/C/IRMS. Isotopic compositions of PAHs, measured all along the procedure, were found to remain constant within uncertainties. This is now added in the new version of the manuscript page 20644. This validation is carefully described in another paper by our group on "source apportionment of particulate PAHs using molecular and 13C molecular isotopic approaches", submitted in Environmental Science and Technology (2012).

Second part: Right. As there is no Standard Reference Materials on particulate-PAH isotopic composition, it was decided in this work to validate our protocol on both measurements of 13C composition of a certified mixture of alkanes and of a certified mixture of PAHs in solution. This was already explained page 20642 but it has been better clarified in the new version of the manuscript.

Pages 20651 and 20652: Sure! This was not a misunderstanding problem but a simple writing error in the text. It is now corrected. Thank you for this because it was then just meaning nothing!

Page 20651 Lines 7 and 8: Right. Errors presented in the Table 7 were only corresponding to standard deviations (+/- 2 sigma). When performing an error propagation analysis, errors were of course enlarged, accounting for global both statistical and systematic uncertainties. Considering the reproducibility of standard isotopic measurements of 0.5‰ the differentiation among investigated wood species remains significant while it is confirmed that isotopic composition of PAHs is independent of the burning type, as expected. This is now emphasized in the new version of the text (pages 20651 and 20654).

Sections 3.2.3 and 3.3: Right. There were some redundant parts that have been deleted and some parts are now at the right place. Both sections are now much improved (simplified) in the new manuscript (pages 20647 - 20652).

Lines 25 to 27 on page 20645 + lines 1-2 on page 20646, lines 4 to 7 on page 20646, lines 25 to 28 on page 20646, or lines 5 to 8 on page 20638: OK. Sentences were maybe not clear or too long and have been all reformulated for a better understanding

Lines 7 to 14 on page 20645: OK. The paragraph has been rewritten and is now clearer for a better understanding in the new version of the manuscript.

All other minor corrections/revisions have been done in the text. In addition, note that the revised manuscript has been corrected by a native English.

Interactive comment on Atmos. Chem. Phys. Discuss., 12, 20631, 2012.