Atmos. Chem. Phys. Discuss.,
https://doi.org/10.5194/acp-2018-617-AC2, 2018

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Drivers of atmospheric deposition of polycyclic aromatic hydrocarbons at European high altitude sites" *by* Lourdes Arellano et al.

Lourdes Arellano et al.

pilar.fernandez@cid.csic.es

Received and published: 4 September 2018

We appreciate the comments and suggestions made by the referee, which will be considered in the revised manuscript. To facilitate the review process, we include our answers under the comment of the referee.

Reviewer's general comments and suggestions: Is that wet deposition and dry deposition samples were not separately collected and studied.

Authors' response: This is beyond the scope of our study. The collection of these two fractions separately had required much higher sampling manpower that was not

available in the research projects supporting the study.

Air-water exchange was not calculated for lakes. (See Tsapakis et al. 2006).

Authors' response: This is beyond the scope of the study, since the objective was not to perform a complete mass balance of PAHs in the studied lakes, but to evaluate the magnitude of their atmospheric deposition in these remote sites and it relation with their accumulation in sediments. In the case of PAHs, the measured deposition fluxes in the lakes already provide the net flux to the sediments.

Specific comments. The authors use rather obsolete literature: e.g. P. 3, lines 90-95 (20 y old!). There many studies after 2005 that could be used a literature.

Authors' response: We will update the literature.

The authors, in the Experimental Section and Table 1, should report which of the 15 EPA list PAHs are considered as LMW and HMW compounds.

Authors' response: We will specify the compounds included in the LMW and HMW PAH groups in the text. However, they are already specify in the footnote of Table 1.

Since they compare with previous studies in which more PAHs were determined. They should also indicate the number of PAHs in the sum (_) (see Tables).

Authors' response: In principle, we have tried, when possible, to sum the 15 PAH included in the EPA list (all excepting naphthalene) as it is indicated in the Table 2 (where the comparison is made). However, this was not always possible, since many studies do not indicate the number of PAHs considered or/and the concentrations of each individual compound that can be used to get comparable PAH sums.

The interpretation of the presence of different PAHs on the basis of their diagnostic concentration ratios should be given very cautiously, since the individual compounds (especially the more reactive ones) are subjects to important degradation mechanisms during their atmospheric transport and before deposition and reaching the lacustrine

environment (P. 8-9; l. 285-305).

Authors' response: We agree with the author. We already consider the effects of photooxidation considering insolation and sampling location in lines 286-309.

Discussing the deposition fluxes and comparing them with those determined in different environments it would useful for the readers to focus on specific compounds. E.g. Those with the highest abundance.

Authors' response: We agree with the author. This is performed in Table 2 where only the 15 compounds selected by the EPA (which includes the most abundant parent compounds) and a specific PAH, benzo[a]pyrene usually taken as a reference compound, are considered.

Interactive comment on Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2018-617, 2018.