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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Polycyclic aromatic hydrocarbons, polychlorinated biphenyls, and chlorinated pesticides in background air in central Europe – investigating parameters affecting wet scavenging of polycyclic aromatic hydrocarbons" *by* P. Shahpoury et al.

Anonymous Referee #1

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GENERAL COMMENTS

The present manuscript "Polycyclic aromatic hydrocarbons, polychlorinated biphenyls, and chlorinated pesticides in background air in central Europe –investigating parameters affecting wet scavenging of polycyclic aromatic hydrocarbons" by Shahpoury and co-workers, reports on air and precipitation levels of selected SOCs and discuss their wet deposition and scavenging from the atmosphere. Reported data comes from the

analysis of a large number of samples and results are presented and discussed consistently. The paper is well written and structured and represents and relevant contribution in this interesting subject. However, there is one major issue related to the analytical method performance and some minor questions which must be addressed before publication (see below).

I would recommend publication of this manuscript after detailed revision of the bellow issues.

Materials and Methods

2.4. Chemical analysis and quality control

Page 26945/L13-14. Some of the pesticides analyzed are not as resistant to acid treatment as PCBs, for example DDTs or HCHs. Did you check that no degradation occurred due to acid treatment in the fractionation step?.

Which are the recoveries from the fractionation step? Further in this comment, it is stated that recovery standards were used however no recovery results is provided at all. This data must be reported to understand the method performance.

Are results corrected by method recoveries?

3. Results

Page 26949/L1-4. The concentrations you reported (GAS: 0.6 $\sim$140 ng/m3 and PART: 0.1 – 190 ng/m3) do not seem to me "by far lower" than those reported by Holoubek et al (GAS: 0.4 – 208 ng/m3 and PART: 0.1 – 360 ng/m3). I would rather say that values are slightly lower. Alternatively, you can try to prove that there are statistically significant differences.

Page 26951/52 Ls27-28, 1-2. Couldn't be the Henry's law constants corrected by the temperature at various heights from the cloud to the ground? Is this information available at all?

Page 26953 Ls1-3. It would have been interesting to analyze the PCB in the rain particle phase which was also collected by the precipitation sampler. Concentrations of PCBs in rainwater were below LODs most probably because only the water dissolved phase was analyzed, since the particle phase was removed due to filtration in C18 columns. Maybe relevant for higher MW PCB (e.g. 118, 138, 153 and 180)?

P26954/Ls5-25. The discussion on the influence of PM ionic species on the scavenging of SOC is not clear to me. The sorption of SOC to PM (OC, EC fractions) is mostly driven by hydrophobic interactions and not ionic binding. How (mechanistically speaking) ionic species may increase the sorption of SOCs (non ionic compounds) to PM and therefore the scavenging ratios?

Interactive comment on Atmos. Chem. Phys. Discuss., 14, 26939, 2014.