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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Factors affecting the atmospheric occurrence and deposition of polychlorinated biphenyls in the Southern Ocean" *by* C. J. Galbán-Malagón et al.

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Responses to reviewer 1

We appreciate the general positive comments of both reviewers, and their constructive comments that have allowed us to improve the manuscript. Below, we respond to Reviewer 1 and explain how the manuscript is improved following this revision.

1) Structure. We have improved the text, trying to simplify the nomenclature, and have introduced a section with the equations in the methods section, trying to simplify the structure of the manuscript and improving the flow of the text.

2) We agree that we need to clarify how blanks, IDL and LOD were quantified. In the main text, only IDL were given normalized by the average volume of sample, while LOD and LOQ were given as pg. In Table S3, the blanks and limits are given in pg, not pg m-3. The volumetric concentrations could be estimated for each sample since we provide the volume for each sample in Table S1. We now give LOD and LOQ as pg, only, in both the text and supplementary material. In addition, we have included the blank levels for the aerosol phase, which were much lower than those in the gas phase.

3) We have improved the comparison of levels with those reported previously by comparing the concentrations of characteristic individual PCB congeners, but for many of the studies there is a large variability in concentrations, which mask any significant time trend. We have added the Kallenborn et al. 2013 reference in the new version.

4) We agree with the reviewer. We meant that due to the variability of concentrations within all the sampling periods belonging to one of the characteristic back trajectory, there are no significant differences. However, it does not mean that the back trajectory does not play a role. Within its group of backtrajectories there are differences in the air masses, in addition, the sampling periods for the gas and aerosol samples were long (sometimes more than 24 hours), and thus there is also a variability of the air-mass during the sampling periods. However, these differences could not be discerned statistically. We have improved the discussion of these back trajectories by pointing out the limitations.

Concerning the aerosol samples, Samples A1âĂŤA4 in Table 8 do not correspond to GA1-GA-4 in Table S8. The sampling periods for each one of the gas and aerosol phase samples are listed in Table S1. The correspondence of samples is indicated in Table S17. Effectively, the sampling periods for aerosol-phase samples was longer than gas phase samples, and in one case we had 2 gas-phase samples for one of the aerosol phase samples (sample A3 with GA5 and GA6 as indicated in Table S17). We have improved this discussion in the new version.

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