Atmos. Chem. Phys. Discuss., 15, C10238–C10240, 2015
www.atmos-chem-phys-discuss.net/15/C10238/2015/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Pesticides in the atmosphere: a comparison of gas-particle partitioning and particle size distribution of legacy and current-use pesticides" *by* C. Degrendele et al.

Anonymous Referee #3

Received and published: 7 December 2015

Review of "Pesticides in the atmosphere: a comparison of gas-particle partitioning and particle size distribution of legacy and current-use pesticides"

This manuscript reports a novel data set on the occurrence, gas-particle partitioning and size distribution of a number of pesticides. This is already a nice contribution. On the other hand, there is some discussion on the processes driving this occurrence and partitioning, but my impression is that this side of the manuscript lacks of novelty, and does not make a great contribution. In any case, as the data set seems to be of good quality (and it is novel) I suggest that this manuscript can be published after some

Full Screen / Esc
Printer-friendly Version
Interactive Discussion
Discussion Paper

modifications in the discussion.

Specific comments:

- Gas-particle partitioning is thought to be a fast process (fast response times to equilibration). I doubt that concurrent emissions lead to lack of equilibrium between gas and particle.

- Page 23653, line 13-15. These two statements need a citation or two.

- Page 23653-line 21. In addition to Pankow 1987, other papers have contributed to substantiate this statement.

- Page 23655, line2. The average sample volume was above 4000 m3, which it looks too much for a temperate region. I wonder about the breakthrough of some of the compounds. This potential artifact should be evaluated before the assessment of gas-particle partitioning. Looking at tables S6 and S7, it seems that potential breakthrough is observed for HCHs, metribuzin, isoproturon, and few others. The nice fact, is that the breakthrough has been evaluated for each sample, and therefore, when it is detected, my impression is that those particular samples should not be used for assessment of gas-particle partitioning.

- Page 23661. I guess that recent application and surface-air exchange are important processes for explaining the atmospheric occurrence of OCP (Cabrerizo et al. ACP 2011) and CUPs. For CUPs, it is possible that a relevant fraction of them is degradaed after weeks/months of application, which would explain a lack of maximum values for the time periods with higher temperatures.

- For many CUPs there is no previous literature on volatilization and gas-particle partitioning, but for some CUPs and especially HCHs and DDTs the literature is abundant and should be cited and discussed. Alternatively, there are studies on soil-air partitioning of pesticides (for example the recent Davie-Martin EST 2015) that could be temptatively used for assessing gas-particle partitioning.

ACPD

15, C10238–C10240, 2015

- Figure 2 and 3. The aerosol type may be different for different seasons, thus different OC type, leading to different partitioning. In addition there is an important uncertainty on the KOA temperature dependence. I doubt that these plots can be used to say anything about lack of equilibrium.

- I would appreciate to see a Kp versus Koa plot for the different compounds and sampling events.

- The manuscript makes a contribution with a novel dataset. The size distribution work is also a nice contribution. However, I think that the gas-particle partitioning assessment should be significantly improved in order to make a clear contribution to the field.

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 23651, 2015.

ACPD

15, C10238–C10240, 2015