

## ***Interactive comment on “Vapor wall deposition in Teflon chambers” by X. Zhang et al.***

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### General Comments:

I think this paper presents a valuable approach for investigating gas-wall partitioning of organic compounds in Teflon smog chambers. The use of CIMS (or PTR-MS) to follow wall losses of reaction products seems ideal because these methods can potentially identify a large variety of compounds for which standards are not available, and also monitor in real time the wall losses of compounds that can occur over a range of timescales.

### Specific Comments:

My one concern with the approach used here is that because of the experimental protocol employed the measurements of wall loss were only begun following 1–7 h of reac-

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tion (at which time the lights were turned off), thus precluding the possibility of observing more rapid partitioning that may have occurred. In two previous studies (Matsunaga and Ziemann, AS&T, 2010; Yeh and Ziemann, JPCA, 2014) we observed that hydrocarbons, ketones, alcohols, and alkyl nitrates reached gas-wall partitioning equilibrium on timescales of roughly 10–100 min, and more recently observed the same behavior for acids and diols (publication in preparation). We also observed (Matsunaga and Ziemann, AS&T, 2010) that following this relatively rapid equilibration a much slower loss occurred on a timescale of  $\sim 100$  h ( $\sim 1\%$  per hour). In the present study, it is stated in the Abstract that losses can occur on timescales of minutes to hours, but for the results presented it appears that the range is  $\sim 10$ – $100$  h. In a previous study by this group (Loza et al., ACP, 2014), similarly long timescales of  $\sim 100$ – $200$  h were also observed using a CIMS to monitor the loss of C12 ketone and alcohol standards that had been added to the chamber. There it was suggested, however, that rapid losses similar to those we have observed would probably not be detected because wall loss measurements could only begin after about an hour because of the time necessary to add the chemicals and mix them in the chamber. A similar explanation may account for the fact that only very slow wall loss was observed in the present study. It would be useful to test this by conducting some experiments similar to those described here, but with the lights turned on for only a few minutes so that rapid wall loss (if present) could be observed. Such experiments might reconcile these measurements with ours, and also with the previous modeling study by this group (Zhang et al., PNAS, 2014) in which an optimized timescale for gas-wall partitioning equilibrium of  $\sim 70$  min was obtained by fitting measured time profiles of SOA formed in similar chamber reactions.

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