

Interactive comment on “Effects of Gas-Wall Partitioning in Teflon Tubing and Instrumentation on Time-Resolved Measurements of Gas-Phase Organic Compounds” by Demetrios Pagonis et al.

Anonymous Referee #1

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This paper presents a combined laboratory and model study on the tubing delay of homologous series of long-chain alkenes and ketones in Teflon tubing as well as in a PTR-MS instrument. A model based on a linear chromatography model was developed, which generally compared well with results of gas-wall partitioning experiments. The authors found that delays vary proportionally with tubing diameter and length, and inversely with saturation concentration and flow rate. The delay caused by the PTR-MS itself without tubing was relatively large, showing that surfaces inside the instrument behave “stickier” than Teflon. The paper raises an interesting topic for the community, because Teflon tubing is widely used in laboratories and field studies, and PTR-MS instruments are often used for fast-response measurements. The authors give indica-

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tions on how to improve sampling and recommend users to characterize tubing and instrument delays.

The paper is well written using a clear language, and is suitable for publishing in AMT after the authors have addressed the following comments:

1) The experiments were exclusively conducted for long-chain alkenes and ketones. What was the reason to choose these classes of compounds? They do not seem to be typical atmospheric semivolatile compounds generally measured by PTR-MS.

2) p.3, l.6: The authors use 20 ppb mixing ratio for all experiments. What was the reason to choose this mixing ratio? What would be the influence of using other mixing ratios?

3) p. 5, l. 15: A linear fitting of the largest dataset obtained in the study for deriving an optimum chamber wall mass concentration is mentioned here. Some clarification would help to understand what was done: Which quantities were fitted against each other? How good was the correlation, and how exactly was the optimum value derived?

4) p. 6, l. 16: Were the experiments conducted just once? How is the reproducibility of the experiments?

5) p. 10, l. 25: It is mentioned here that CIMS techniques are used for detecting multifunctional groups and that these provide challenges due to their stickiness. The experiments conducted for this paper focused on alkenes and ketones, which are not multifunctional. Would the authors expect their approach to be suitable as well for compounds containing other functional groups, such as carboxylic acids or aldehydes?

6) Fig. 3: The plots look like linear fits through just two data points. Do you expect the relationship to be linear for more data points? Is there any experimental data to confirm this?

7) In the title, the authors use the general word “instrumentation”. Maybe it would be more precise to replace this with “PTR-MS”, as this is the instrumentation for which the

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study was conducted.

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