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 #2

Received and published: 27 September 2017

This manuscript describes the gas-wall partitioning of organic compounds in Teflon tubing and "real-time" instruments using Teflon materials such as PTR-MS. Rapid partitioning of compounds with c^* in the range of 10e4 to 10e7 micro g /m3 causing delays in instrument response. These delays were measured for 2-ketones and 1-alkenes falling into the respective c^* range as a function of tubing length and flow rate. The delays were also modelled using a simple chromatography model and the gas-wall partitioning framework of Matsunaga and Ziemann (2010). The model predicts tubing delays in agreement with experimental results concluding that compound time profiles can be shifted by minutes to hours. These time delays have been observed and described already earlier. See and include the following reference: Schaub et al. 2010

(doi:10.1111/j.1399-3054.2009.01322.x) Response times of sesquiterpenes and green leaf volatiles were investigated in a plant cuvette + Teflon tubing at different temperatures.

In the present manuscript additional effort was undertaken to describe observed time delays with a model. This is very useful for the atmospheric measurement community drying to measure not only volatile- but also semi- and non-volatile organics in the gas phase.

The manuscript is well written and might be suitable for publishing in AMT after the authors have addressed the following comments:

All experiments were performed under dry conditions and I wonder how relative humidity (RH) will impact the delay time of different compounds. I would like to see either RH results included in the manuscript or a paragraph discussing this issue. Measurements in the real atmosphere and also in smog chambers contain a substantial amount of RH and additional solvation effects of water adsorbed into the Teflon walls might affect organic compounds differently. Discuss in detail if and how your "dry" results can be applied to real world measurements.

Page 6, lines 15-20: You describe time profiles shown in Fig. 2a, signal (y-axis) normalized product ion count rates as a function of time (x-axis). In the sentence before you talk about "delays" that were quantified in this study . . ..90% of the total change. . . confusing, please reorganize. Fig. 2a: Explain why the signals of 2-octanone, 2-decanone, and 2-dodecanone steadily decline after the sharp step function increase. Explain the "noise" especially for 2-tetradecanone. Discuss reproducibility of individual measurements. Present error estimates for individual compounds. Fig. 2b: 2-octanone is missing

Mention details such as line dimension and flow rate in the figure caption.

Page 7, lines 5-20: The flow velocity has a radial profile in a 0.47 cm ID tube. Which

flow velocity is used and why?

In the text, caption and figure 2,3, use either "a" or "A"("b" or "B")

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