

***Interactive comment on* “Sample drying to improve HCHO measurements by PTR-MS instruments: laboratory and field measurements” by B. T. Jobson and J. K. McCoskey**

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Response to Anonymous Referee #1.

Thanks for your comments.

RC# 1. Page 19851, line 12. Was the transmission efficiency of the instrument not measured? Generally, transmission efficiency increases with  $m/z$  up to about  $m/z$  100. This would lead to a higher measured normalized sensitivity than calculated with  $\epsilon = 1$ . I am sceptical about this interpretation.

We did not measure the transmission curve. Our ETP multiplier aged rapidly at high

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ion count rates causing problems with ion transmission tests where the reagent ion is titrated away. We agree the ion transmission for benzene is greater than that of  $\text{H}_3\text{O}^+$  based transmission curve tests we have done in the past with other multipliers. We don't have a quantitative explanation for the differences between observed sensitivity and measured. To avoid being speculative we removed the sentence "The lower observed sensitivities were likely due to differences in  $\text{H}_3\text{O}^+$  and  $\text{C}_6\text{H}_7^+$  ion transmission efficiencies through the quadrupole and differences in detector sensitivities to these ions."

RC# 2. Page 19854, line 12. -set points- not -sets points- Corrected.

RC# 3. Page 19858, line 27. As stated elsewhere benzene does not react with the water dimer.

Yes. We should emphasize this point. We changed the sentence to read: "Benzene displayed the weakest dependence as expected since it is not thought to react with the water dimer."

RC# 4. Page 19859, line 15. The HCHO concentrations in this test were above 0.5 pbb. It is shown that there are no large losses of HCHO to the water trap but no quantification is performed. On Page 19860 the detection limit is calculated and includes only the counting statistics of the detector. Detection limits in the order of 78 to 95 pptv were calculated. What can the authors say about HCHO losses in this low concentration range? Are reliable measurements possible close to the detection limit?

This is a very good point and something we did not determine with field or lab experiments. We added the following text to the end of the paragraph discussing HCHO detection limits: "However, the detection limits calculated are based on detector noise and are not method detection limits that account for potential losses of HCHO at low mixing ratios to the water trap and sampling lines."

RC# 5. Page 19859, line 26. -2009- not -2008- Corrected.

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RC# 6. There are some references missing, e.g. Staudinger and Roberts; Warneke et al.

Corrected: Staudinger, J., Roberts, P.V.: A critical review of Henry's law constants for environmental applications, Crit. Rev. Environ. Sci. Technol., 26, 205-297, 1996.

Warneke et al. (2001) added to text where the "(2001)" was missing.

RC# 7. Page 19866, line 18. -PTR-MS measurement- not -PTR-MSmeasurement-  
Corrected.

RC# 8. Figures: generally the font size of legends, data and axes labels is too small.

Corrected. Figure labels, axis values, and annotations font sizes were increased to font size 14.

RC# 9. Fig 1. In the Figure header it reads 108 Td while in the legend it says 100 Td.

Corrected to read 108 Td. Checked text and fixed Table 1 to read Td=108.

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Interactive comment on Atmos. Chem. Phys. Discuss., 9, 19845, 2009.

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