

## ***Interactive comment on “Sample drying to improve HCHO measurements by PTR-MS instruments: laboratory and field measurements”***

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**Anonymous Referee #1**

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The paper presents a water removal system which improves the capability to measure formaldehyde by PTR-MS instruments. Although the technical approach is not new, it is used for VOC measurements by GC, its application to the measurement of water soluble oxygenates is not expected to work in the first place. However the authors demonstrate in a clear way under what conditions water can be removed without losses of HCHO. Sample drying allows operating the instrument at lower E/N ratios which leads to lower fragmentation of compounds. The authors show that methylhydroperoxide might thus be observed by PTR-MS, which fragments at high E/N ratios. This new technique not only improves the sensitivity to formaldehyde but also reduces the signal dependence of other species like aromatics on variations of ambient humid-

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ity and possible fragments of other compounds. Since PTR-MS has found wide use in atmospheric chemistry this approach could significantly advance future applications of PTR-MS. The method is clearly described and the results are carefully presented and discussed. I strongly favour publication in ACP.

Specific comments/technical corrections

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.

Page 19854, line 12. -set points- not -sets points-

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

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?

Page 19859, line 26. -2009- not -2008-

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

Page 19866, line 18. –PTR-MS measurement- not -PTR-MSmeasurement-

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

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