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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Technical Note: Intercomparison of formaldehyde measurements at the atmosphere simulation chamber SAPHIR" *by* A. Wisthaler et al.

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We would like to thank Referee #1 for the positive review of our manuscript. In the following we will answer step by step his/her comments.

1. Accurate HCHO gas-phase calibration of the PTR-MS using a permeation-tube-based gas standard generator turned out to be problematic. The PTR-MS HCHO calibration factors obtained during two successive days following identical calibration procedures differed by 40% and PTR-MS response factors for HCHO were obtained by two alternative methods, as described in the manuscript. We will change the manuscript and add one paragraph to clearly specify why this method was disregarded.

2. The Hantzsch MA-100 instrument was independently calibrated by its own permeation tube system, however, after the campaign. The independent calibration was prerequisite for the participation in the formal, blind intercomparison.

3. Days 1 and 5 of the intercomparison experiment were characterized by problems of the individual instruments of the simultaneous OVOC intercomparison and of the sampling line as described in Apel et al. (manuscript submitted to JGR). Therefore, these days were disregarded for the OVOC intercomparison. However, for the HCHO intercomparison shown here, we think that the data in section A of day 5 can be used to determine the sensitivity of the instruments at low concentrations. These measurements, which agree very well, were already done in the complex matrix of outside air. The difference between the measured and calculated values in section B of day 5 was most like caused by an uncomplete transfer of HCHO into the chamber, as stated in the text.

4. The experiments shown in this study provide evidence for a careful consideration of previously published HCHO values. However, we think that a carefully calibrated instrument of either technique can provide correct HCHO values within $\pm 20\,\%$. As shown by the experiments here these calibrations have to be done over the range of the expected HCHO levels and as close as possible to the ambient levels of humidity and ozone. If these criteria are met for previous HCHO measurements in the field is outside of the scope of this article.

5. The manuscript for the final submission will be changed in line with the minor comments. We will change ppb to ppt also in Table 1 according to the suggestions of the referee. The dew point temperature during the day 2 experiment is out of scale at -45°C as stated in the caption.

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