Atmos. Meas. Tech. Discuss.,
doi:10.5194/amt-2019-139-SC1, 2019

Atmospheric Measurement Techniques Discussions

Interactive comment on "Intercomparison of nitrous acid (HONO) measurement techniques in a megacity (Beijing)" *by* Leigh R. Crilley et al.

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Received and published: 25 July 2019

This paper presents measurements of HONO by several instruments and is of interest to many researchers (myself included) who are interested in HONO. Given the growth in the use of the iodide ToF chemical ionization mass spectrometer method, it would be helpful for further details of the instrument's operation to be presented.

The IMR pressure is held at 400 mbar, which is higher than that used for most research groups' IMRs (∼50 – 100 mbar). What is the reason for operating at this relatively high pressure?

Backgrounds were determined using dry N2. The authors state "The overflowing of dry N2 will have a small effect on the sensitivity of the instrument for those compounds

whose detection is water dependent. Here we find that due to the very low instrumental background for HONO, the absolute error remains small (<33 ppt)". According to the same Lee et al. 2014 paper referenced in the manuscript, the sensitivity (as configured in Lee et al) varies by a factor of five between dry conditions and the most humid conditions tested (PH2O = 0.8 mbar). It would be useful if there were a figure that showed the time series for m/z 174 for a typical sample & background measurement cycle to support the statement that the uncertainty in the background is essentially inconsequential.

The sensitivity is quoted as 0.28 counts/s/ppt – at what humidity? A graph of the HONO sensitivity as a function of humidity would be helpful, especially since it could differ than that measured by Lee et al given the different IMR pressures used. Is this sensitivity normalized to 1,000,000 cps of reagent ion? What is the total reagent ion signal? Finally, additional details on how potential HONO loss or formation in the sampling lines was investigated for most of the instruments used would be helpful. Thanks.

Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2019-139, 2019.