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Atmospheric Measurement Techniques Discussions

Interactive comment on "High concentrations of N_2O_5 and NO_3 observed in daytime with a TD-CIMS: chemical interference or a real atmospheric phenomenon?" *by* X. Wang et al.

Anonymous Referee #2

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TD-CIMS measurements at Hong Kong are presented and their potential interferences analyzed. It is shown that PAN/NO2 do significantly interfere at 62 amu. Nevertheless, it is argued that significant levels of daytime N2O5 have been observed.

This manuscript is concise and well illustrated. To my opinion, data and possible interferences have been discussed in great detail.

This paper conveys interesting technical (interferences at 62 amu) and scientific (daytime levels of N2O5) information, both of which warrant publication.

Concerning the identification of possible interferences, it is stated that all possible in-

terferences have been considered with only PAN/NO2 mix leading to large signal not undergoing zeroing in their experimental procedure. I'm just wondering as Honk Kong is a densely populated region facing strong anthropogenic and biogenic emissions, if such a statement is really true? Organic nitrate are maybe more abundant and ubiquitous than thought, especially in organic aerosols. Could organic aerosols carry organic nitrate that may either directly or indirectly (through their possible, but not known partitioning between phases) interfere in these measurements?

As Hong Kong face both biogenic and anthropogenic emissions, I would have an unfair comment to the authors. In fact, a paper just appeared (after the submission of this AMT manuscript) stating that NO2 reacts with Criegee intermediate producing nitrate radicals (i.e., NO3 radical production from the reaction between the Criegee intermediate CH2OO and NO2, Phys. Chem. Chem. Phys., 2013, 15, 17070). Would reactions like that one be captured by these CIMS measurements? If yes, this would be a great outcome and a new start in characterizing the atmospheric importance of such processes.

NOx were measurement with a chemiluminescence instrument coupled to a photolytic converter. This could also be used to highlight HONO, HOx, NOy interferences in these measurements has this been investigated as it may also convey information about the CIMS interferences?

Finally, while the data do point toward high N2O5 day time levels, what would be the reason for that? Is it specific to Hong Kong or do the authors think it is a widely spread phenomena?

In conclusion, this is a nice piece of work.

Interactive comment on Atmos. Meas. Tech. Discuss., 6, 7473, 2013.