

Interactive comment on “Interference from alkenes in chemiluminescent NO_x measurements” by Mohammed S. Alam et al.

Anonymous Referee #2

Received and published: 9 July 2020

The manuscript by Alam et al. presents a chamber study about the interference of alkenes in chemiluminescent NOx measurements. Varies of alkenes are studied and shown that the interference to NO ranged from 1% to 11%. However, the interference to NO2 detection is more complicated. Overall, this paper presented a useful study for promoting the high precision NOx measurement. Some comments should be addressed before considering the publication in AMT.

General comments. 1. The introduction of these NOx instruments should be added to the experimental section. I suggest the authors add a schematic figure to introduce the background and sampling mode of the NOx measurement, which could help the non-professional readers follow the background interference part easily. 2. Line 320, the KPI is a good indicator and easy to understand, but the Supplementary Information

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for calculation details seems not finished as there is no equation of $KPI = ???$. Considering that the KPI is important in this paper, the final equation should be listed in the main text. 3. The NO measurement by monitor 2 has small interference by alkene, and NO₂ measured by monitor 2 free of the interference of alkenes, does this result mean the API 200 AU monitor has better instrumental design compared with other monitors, at least in avoiding the alkene interference? 4. According to the results in table 2 and Line 258-259, monoterpenes have no interference. While in the conclusion part (Line 485 and 502), the author proposed the monoterpene should be noted, it is contradicted, please clarify it. 5. What happened about the monitor 2 in figure 1-2 in NO₂ measurement? 6. Figure 1-3 is very confused. Why are some fitting results not shown? If the non-significant result not shown, why the measured NO₂ by Monitor 4 is plotted in figure 1 with very $r^2=0.001$?

Specific comments. 7. Line 79-85, the cited reference Fuchs et al., (2009) is about cavity ring-down spectroscopy, so the citation is wrong (also cavity-enhanced absorption spectroscopy should be mentioned). An appropriate reference should be added about CE-DOAS. 8. Line 203, missed a blank between 5 and ppm. There also many errors like this (e.g., Line 190...) 9. Line 296, the O₃ abundance, and residence time are not discussed in the following paragraph. 10. Figure 1-3, panel B and D, change the y-axis as NO₂ rather than NO (although the mixing ratio are retrieved as NO). 11. The average results in figure 4(B) do not make sense. I suggest removing it. 12. Figure 5, the left and right y-axis should be changed, please change to (NO/NO/NO_x) and (α -terpinene). 13. The time resolution of data for the four monitors and shown in figures should be clarified. 14. Line 421-424, the label * and # are missed in Table 3. 15. The caption of Table 4 should add the reaction rate constant of NO+O₃ (298 K) for intercomparison. 16. Line 450-453, are you mean the possible HOCO is an interference of the chemiluminescent?

Interactive comment on *Atmos. Meas. Tech. Discuss.*, doi:10.5194/amt-2020-164, 2020.

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