

Atmos. Meas. Tech. Discuss., referee comment RC2
<https://doi.org/10.5194/amt-2021-149-RC2>, 2021
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Comment on amt-2021-149

Anonymous Referee #2

Referee comment on "Correcting bias in log-linear instrument calibrations in the context of chemical ionization mass spectrometry" by Chenyang Bi et al., Atmos. Meas. Tech. Discuss., <https://doi.org/10.5194/amt-2021-149-RC2>, 2021

General comments:

In this paper, the authors examined the instrument bias in a log-linear based calibration curve and provide a method to correct that bias, which are useful for researchers in atmospheric chemistry and sciences. I think this work is suitable for AMT journal topic. I would recommend accepting this paper with a couple of revision and re-consideration mentioned below.

Specific comments:

1. In Figures 1, 4, and 7, the authors used 100, 1000, and 10000 ions/analytes for the simulation of sample relationship between sensitivity and $dV50$. I have a couple of questions here: (i) What are those ions/analytes in real? (Are those able to exist in real?) (ii) How were the sensitivities and $dV50$ for individual ions/analytes determined? It would be good if more detailed explanations regarding those matters are added in the caption or the main text.
2. Also I think, it would be good if the author can describe how the bias correction method can correct the measured results in real. According to previous literature (e.g. Iyer et al., JPCA 2016; Lopez-Hilfiker et al., AMT 2016), the sensitivities and $dV50$ of several compounds for iodide CIMS have been measured. Using those values, the usefulness of the method developed in this work should be able to be discussed.
3. Sensitivities in iodide-CIMS should have uncertainties arising from binding energy between I^- and analyte. I am wondering how large or small these uncertainties are compared to the bias arising from instrumental parameters. It is possible to quantitatively discuss it?
4. In Introduction section, the authors mentioned this work focuses on the calibrations of analytes in an iodide-CIMS. So, maybe it would be better the title also says "iodide chemical ionization mass spectrometry".