

Interactive comment on “Constraining the sensitivity of iodide adduct chemical ionization mass spectrometry to multifunctional organic molecules using the collision limit and thermodynamic stability of iodide ion adducts” by F. D. Lopez-Hilfiker et al.

Anonymous Referee #1

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Lopez-Hilfiker et al. presented the laboratory experimental results of fragmentation and sensitivity behaviors of oxidation products of alpha-pinene, which can be applicable other terpenoid species, using a ToF-CIMS system with I⁻ ion chemistry. The main goal of this research seems pretty clear that the evaluating sensitivities of alpha pinene oxidation products as the preparations of the standard samples are extremely difficult. The N₂O₅ sensitivity towards I⁻ ion chemistry, which is known as a collisional limit, is used for the evaluation. The authors applied the concepts of fundamental ion – neutral
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molecule interactions to the ToF-CIMS analytical system with an expanding user basis to reasonably assess actual concentrations of all the identified peaks in complex ToF-CIMS spectra. The authors achieved the goal by assessing fragmentation patterns and transmission efficiency for a wide range of ion masses. As I⁻ ion chemistry has been highlighted for its sensitivity towards highly oxidized organic compounds, this study will be highly beneficial to the user base. I think that the manuscript is well written and aligned well with the purpose of Atmospheric Measurement Technique. I would recommend the publication of this manuscript after addressing the following concern. The ion transmission efficiency as a function of mass is a critical parameter to assess sensitivity of analytes along with ion-neutral reaction rates in the CIMS analytical system. The authors followed the evaluation method for transmission efficiency presented in Huey et al. which utilized a quadrupole mass spectrometer system. Therefore, I urge for authors to justify whether the identical method can be utilized to the ToF system.

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