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Atmospheric Measurement Techniques Discussions

Interactive comment on "Quantification of biogenic volatile organic compounds with a flame ionization detector using the effective carbon number concept" *by* C. L. Faiola et al.

Anonymous Referee #1

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This is a worthwhile contribution. The discussion of FID response to linalool and myrcene raises some important points and suggests some underestimates in previous studies. The paper indicates the importance of accounting for ECN when analyzed by FID. It also stresses the importance of having an in-house system check for quantitative assessments of more difficult VOCs. ECN's must be taken into consideration when quantifying by FID, especially for more complex bonding structures (1+ double bonds, alcohol, ether, carbonyl, aromatic or tighter cyclic bonding). Confirmation of analytical calibrations is needed, especially for more difficult species like SQTs. This dynamic dilution system seems to be an inexpensive, simple solution.

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Interactive Discussion
Discussion Paper

MS systems such as TOF PTRMS are ahead of FID in many respects, especially in speed and sensitivity, but response of these systems to individual terpenoids and their isomers is not well characterized, and there is limited data using such systems. The traditional PTRMS systems have been around awhile, but they see only protonated parent ions and can't distinguish between different monoterpenes, for instance.

Regarding the experimental setup, there is concern about the actual SQT concentrations being produced at steady-state. Consider adding more on the following:

- Explain how (or if) the PTR-MS was calibrated. - Explain how the mixing ratio was determined. - What types of losses are possible in the dilution system presented? - Was anything accomplished to ensure limited or no accumulation of moisture (H2O) within the cryotrap etc.? The presence of moisture in these experimental systems can produce inaccuracy.

Regarding sampling issues with SQT, myrcene, ... could the experimental setup have caused these? Perhaps the syringe pump/dilution system is not the ideal sample generation method for some of these compounds. Why wasn't a capillary diffusion generation method with gravimetric monitoring used? This latter system is known to be quite robust.

Regarding (p. 2432-2433) the discussion about SQT sampling difficulties that suggests homogeneous nucleation of SQTs in the cryo-cooled sample loop, causing them to pass through the sample loop.... what about wall losses or incomplete thermal desorption from the cryotrap during sample generation. Should these and similar possibilities be suggested as well?

Figure 4. Change y-axis to reflect $\pm$ differences from the respective carbon number of each compound. ie. (Carbon Number) - (Theoretical ECN) and (Carbon Number) - (Measured ECN) plotted on a +3 to -3 y-axis to reflect differences on a more legible scale. Also, place the carbon number in brackets.

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Interactive comment on Atmos. Meas. Tech. Discuss., 5, 2415, 2012.

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