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Atmospheric Measurement Techniques Discussions

Interactive comment on "Development and validation of a portable gas phase standard generation and calibration system for volatile organic compounds" *by* P. Veres et al.

Anonymous Referee #2

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Veres et al. report on the development of a portable calibration system for gas-phase hydrocarbons and small oxy-hydrocarbons. Their approach is i) to use a home-made permeation tube for generating ppm-levels of the calibrant in a low-CO2 atmosphere (zero air), ii) to convert the calibrant into CO2 by flowing it over a noble metal catalyst and iii) to quantify the increase in CO2 with an independently calibrated commercial CO2 sensor. The approach of measuring hydrocarbons by conversion into CO2 is certainly not novel. I have, however, not found any report in the recent scientific literature that describes this type of application. The proposed calibration method may constitute an advantageous alternative to standard methods for many researchers in our field. I thus recommend publication in AMT with minor revisions.

General comments:

I am not sure it is correct to use the generalized term “volatile organic compounds” (both in the title and the body of the text). The authors have shown their approach works for pure hydrocarbons and simple (monofunctional) oxy-hydrocarbons, but VOCs may contain heteroatoms other than O, e.g. N, S, or Cl atoms. Complete conversion cannot be assumed a priori for N-containing compounds and Pd catalysts are known to get deactivated by poisoning with S- or Cl- containing compounds (even at low ppm levels). Even for multifunctional oxy-hydrocarbons a complete conversion into CO2 needs to be demonstrated.

In addition to “inch” and “psi” the authors should also provide “cm” and “mbar” as units.

Specific comments:

page 337, lines 23-26: The authors should describe in detail how they constructed the permeation tubes (liquid volumes, tubing and cap materials, tubing dimensions including wall thickness, types of crimps, suppliers, etc.).

page 338, line 17: Did the authors find any evidence for an interference from IR absorption of VOCs ? Please specify.

page 339, lines 17-19: Why was the benzene calibration based on measurements from 20 different VOC mixes ? Does the 20 % uncertainty refer to the accuracy in one individual mix, or the standard deviation from the 20 different mixes ?

Tipos:

Page 33, line 24: “degredation”

Table 1 “Acetonitile”

Interactive comment on Atmos. Meas. Tech. Discuss., 3, 333, 2010.