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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Quantification of diesel exhaust gas phase organics by a thermal desorption proton transfer reaction mass spectrometer" *by* M. H. Erickson et al.

Anonymous Referee #2

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The authors present a novel combination of a thermal desorption sampler for IVOCs with a quadrupole PTR-MS as analytical tool. Their main conclusion is the claim that during the CARES campaign in Sacramento, CA, ambient air concentrations of alkanes from diesel exhaust are 10 times higher than the sum of alkylbenzenes. After careful consideration we conclude that this is a misinterpretation of the data. Therefore the manuscript has to be rejected.

There is no convincing evidence that m85 and other presented signals are unique tracers for alkanes. The authors state that there are known interferences at m57 and m71. Their own results indicate that m99 is not a unique signal either. So, it is not a rea-

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sonable assumption that m85 should be a unique tracer for diesel alkanes. Moreover, the presented mass spectrum of diesel fuel clearly shows that the signal intensities of m161, m85, m71, and m57 are of similar magnitude; however, in ambient air m161 is more than an order of magnitude lower than the other masses. Alone from the data presented in the manuscript there is sufficient information to arrive at the conclusion that the presented method to assess total diesel C12-C16 alkanes is questionable. Furthermore, our own PTR-TOF-MS measurements in similar environments indicated that most of the signal at m85 is due $C_5H_9O^+$ and $C_4H_5O_2^+$. Therefore we conclude that the presented method of using m85 as tracer for diesel exhaust is flawed.

The combination of a tenax sampler with PTR-MS, however, is promising and we encourage (and hope) that the authors submit a method paper – AMT would be an appropriate journal for this.

Other comments:

Abstract: a detection limit of ∼one microgram per m3 is stated, but this is nowhere discussed or established in the manuscript.

More information needed in Section 2.1: Operation temperature and coating of the valco valve; how was the trap electrically isolated from the drift tube? Material of S2 valve. Operation temperature of all transfer lines, valves and the drift tube. Detailed information on how the trapping system was operated (in lab and field) is missing. Some of this information is given later (section 2.6) but it should be given here.

Section 2.4: It is not clear which measurements have been done with PTR-MS alone or with the trapping system. A comparison between direct measurements and the tenax system (which does not sample volatile compounds) would be interesting anyway.

Section 2.6: inner diameter and operation temperature of the IVOC inlet? Flow through VOC inlet?

Because of our fundamental objections we do not provide further comments on Results/Discussion

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Interactive comment on Atmos. Chem. Phys. Discuss., 12, 5389, 2012.

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