Atmos. Chem. Phys. Discuss., 15, C11316–C11319, 2016
www.atmos-chem-phys-discuss.net/15/C11316/2016/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Vehicular emissions of organic particulate matter in Sao Paulo, Brazil" *by* B. S. Oyama et al.

Anonymous Referee #1

Received and published: 10 January 2016

Comments on "Vehicular emissions of organic particulate matter in Sao Paulo, Brazil" by Oyama et al. The manuscript details three set of measurements – two tunnels and one ambient – focusing on offline analysis of organic aerosols from vehicular origin. Using HR TD-PTR-MS and TOT analysis the chemical composition and volatility of OA from vehicular sources has been analyzed and its emission factors from LDV and HDV derived.

The manuscript presents new research which clearly fits within the scope of the journal. I do have, however, strong concerns regarding the accuracy of emission factors calculated here and I recommend publication only once this topic is much improved and clearly resolved. The way I see a complete remodeling of the manuscript, whether by increasing the relevance of ambient measurements in the manuscript, or its complete

Full Screen / Esc
Printer-friendly Version
Interactive Discussion
Discussion Paper

removal from the manuscript might be in order in case its mere use as background site is not justifiable to a level compatible to a journal as ACP. This topic, as well as others, are presented below.

Major comments:

* Background subtraction is a major issue with the results described here and I am not convinced that EF values are well calculated, to state the least. Prior acceptance of the manuscript, the authors must provide convincing arguments that EF values calculated using ambient measurements at one site as background values for tunnels – which apparently are not nearby (not clear also!) – is accurate. One suggestion to make it in the least justifiable is to compare, if existing, concentration of parameters such as OC, EC, PM2.5, O3, CO, SO2, NO, NO2, NOx, NOy and so forth from the tunnel entrance and the ambient sampling site. Please also expand thoroughly explanation on how was it implemented, as only very broad and unclear explanation was provided in the manuscript from P.33761 L.20 to P.33762 L.16.

* The motivation of the work is somewhat lost along the manuscript. The abstract and introduction mention ethanol being used by LDV, but no deeper discussion is provided on expected changes in tailpipe emissions resulting from the fuel itself, whereas there is already abundant literature in the topic: Karavalakis et al., 2014; Matti Maricq, 2012; Myung et al., 2009 just to name a few.

* As a general issue of the manuscript, hardly the results presented were put in context by comparing with known literature, and when performed, very poorly. The clearest example is the V-K diagram (P.33770 L:7-12 and figure 5) which were frequently studied from the AMS community but very lightly compared in the manuscript, in particular for ambient measurements. Would be interesting a comparison of different chemical groups and their volatility with results elsewhere.

Minor comments:

ACPD
15, C11316–C11319, 2016

* Abstract. P.33756, L.1-2: This starting sentence provides the reader the (wrong) impression that there are these only four factors regulating the impact of vehicle emissions in urban pollution, and furthermore, that they are equally important, which obviously is not true. Please rephrase it.

* Please use E25 throughout the manuscript as oppose to gasohol. Also, would be better for the reader E100 instead of hydrated ethanol.

* The acronym for tunnel identification can be improved, maybe JQ and RMC?

* Abstract. P.33756, L.26-27: Please rephrase.

* P.33758,L.10-12: It is not clear in the sentence the role of ethanol in gasoline and ozone by this sentence alone, please make it clearer.

* P.33758,L.23: This paragraph is disconnected from the rest of the text, please remove it or distribute it along the text where it would belong.

* P.33758,L.28: Replace density by dense

* P.33758,L.29: Remove “in”.

* P.33758,L.28 – P.33759,L.22: Please cut down these two paragraphs to the central question: What is the current knowledge of chemical-physical characteristics of vehicular emitted organic aerosols in Sao Paolo, and their role on urban pollution?

* P.33760,L.11: It is missing a period between LT and TJQ.

* P.33760,L.18: it is missing the word “wind”

* P.33771,L.12: Please combine this paragraph to the previous one.

Karavalakis, G., Short, D., Russell, R. L., Jung, H., Johnson, K. C., Asa-Awuku, A. and Durbin, T. D.: Assessing the Impacts of Ethanol and Isobutanol on Gaseous and Particulate Emissions from Flexible Fuel Vehicles., Environ. Sci. Technol., 48(23), 14016–14024, doi:10.1021/es5034316, 2014.

ACPD

15, C11316–C11319, 2016

Matti Maricq, M.: Soot formation in ethanol/gasoline fuel blend diffusion flames, Combust. Flame, 159(1), 170–180, doi:10.1016/j.combustflame.2011.07.010, 2012.

Myung, C. L., Lee, H., Choi, K., Lee, Y. J. and Park, S.: Effects of gasoline, diesel, LPG, and low-carbon fuels and various certification modes on nanoparticle emission characteristics in light-duty vehicles, Int. J. Automot. Technol., 10(5), 537–544, doi:10.1007/s12239-009-0062-9, 2009.

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 33755, 2015.