

Interactive comment on “Vehicular emission of volatile organic compounds (VOCs) from a tunnel study in Hong Kong” by K. F. Ho et al.

Anonymous Referee #1

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The manuscript Vehicular emission of volatile organic compounds (VOCs) from a tunnel study in Hong Kong by Ho et al present the results on vehicular VOCs profiles and emission factors from tunnel experiments. The data can be helpful to understand the VOCs emissions, and their contribution to local air quality issues. The reviewer recognizes the value of the measured data, however concludes that the manuscript needs more in-depth scientific analysis, before it is accepted for publication.

The specific comments: 1. The introduction part mentioned more about the source profiles, the reviewer thinks that the literature review for emission factors will have to be added. The evaluation of the advantage/disadvantage of chasis-dynamometer and tunnel experiment needs to be re-summarized. And the paragraph of line 10-20 on page 12649 read strange, how this paragraph fits into the introduction section?

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2. The method section had also some problems, the reviewer wonders why the position of VOCs sampling sites were selected: 686 m from the entrance, and 350 meters from the exit? Secondly, the authors really need to clarify how to distinguish the gasoline, diesel fuel and LPG powered vehicles from such a tunnel experiment? One cannot tell from either traffic counting or video recording? I would accept if the authors state the categories of motor cycle, cars, vans and buses. I personally think this is an important issue, and will affect the discussion section. And finally, the 5 pairs of samples in summer seem to be so limited for a reliable estimation of emission factors, the authors merged these data with the ones in winter time?

3. As to The results and discussion section, I had arguments as following: (1)I think the reader want to know from the results shown in table 2 which species could be attributed to vehicular emissions. Therefore I would suggest to make several groups in table 2 by the differences between inlet and outlet, to indicate clearly that some species had evident emissions from vehicles, some species were likely from vehicular emission, and some species were definitely not from vehicles. The paragraph in line 5-20 on page 12655needs to be re-wording with a focus on VOCs species;

(2)The emission factors obtained from this study need to be compared with the ongoing vehicular emission standards in Hong Kong. The comparison in table 5 does not make much sense without indication of the emission standards of vehicles, and typical vehicle types running in those tunnels ;

(3)The correlation analysis is interesting, but one has to aware that within the tunnel, the correlation could not support the conclusion of the same source origin, like benzene and CO, and fuel evaporation and exhaust, as they are all vehicle related, and therefore could show correlation, but they are from different source origins.

(4)The Ozone formation potential calculation is not necessary for this manuscript, it makes more sense when comparing with other sources.