

Interactive comment on “Vehicular fuel composition and atmospheric emissions in South China: Hong Kong, Macau, Guangzhou, and Zhuhai” by W. Y. Tsai et al.

Anonymous Referee #1

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General comments

The paper presents important new data of both VOCs vehicle emission profiles and fuel compositions for a rapidly developing area. The contributions in this paper will greatly help during the design of an emission-based air quality control strategy in this region. In the manuscript some general claims may need further descriptions and references to sustain them. Also, given the potential use of their results for future studies in the region (like air quality modeling or source apportionment techniques), all their results should be clearly enumerated with standard error measures whenever possible. The paper is well organized but would benefit from some editing of grammatical errors.

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Specific comments

1. The need of references for sustaining some claims has been already addressed by other reviewers. I would only add the comment on section 2.1: “In addition to auto-exhaust, evaporative loss of unburned fuel is an important emission source from automobiles.” It is not clear if the authors try to establish it as a general comment from other studies or as a claim for the PRD region from their results. The quantification of the relative importance of evaporative losses in the overall emissions burden should be further addressed in the discussions section.
2. Besides the vehicle fleet descriptions made for the region of Hong Kong, the paper would benefit if the authors include a more complete description (maybe in the form of a table) of the vehicle fleet composition in each of the four regions at the time the study was done. This may be very important for the paper regarding the representativity and/or the generality of the results in a rapidly changing region as the south of China. Similarly, and given the diversity of fuel manufactures in the region, a description of the fractional distribution of fuel type (gasoline, LPG, diesel) and usage/sales by gasoline producer company each region is needed for the same purpose. Such information can be used to scale the results.
3. Section 2.2 would benefit if a detailed description is made of the methods used for determining the precision of the measurements. Also, the phrase “The accuracy for the NMHCs varies for different compounds, ranging from 2% - 20%.” is ambiguous.
4. Given the variability of the results, a description of the vehicle fleet composition during the tunnel and road sampling studies may be needed for properly comparing the VOC profiles in Figure 4. I would also emphasize the need for clarifying throughout the paper, including the abstract, that fuel samples represent evaporative composition, particularly because their results are based on % volume composition, rather than on ppbC, and therefore the underestimation of less volatile compounds may be important.
5. Can the authors quantify the influence of non mobile sources on their LPG samples?

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Others: 1. There is a typo in Section 3.1: “4.07% +- 4.7”, it should be “40.7% +- 4.7”.

Interactive comment on Atmos. Chem. Phys. Discuss., 6, 3687, 2006.

ACPD

6, S1199–S1201, 2006

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