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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Analysis of non-regulated vehicular emissions by extractive FTIR spectrometry: tests on a hybrid car in Mexico City" *by* F. Reyes et al.

Anonymous Referee #1

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The manuscript by Reyes et al. is well written but offers little new science. I tend to agree with referee #2 that the major problem with the MS is lack of novelty and generality. Using extractive FTIR to measure vehicle exhaust is not new and a study of one vehicle does not provide test results that can be generalized.

I have several specific concerns.

1) I am very skeptical that gas phase ammonia (and methanol) can be accurately measured after passing through a water trap. The authors' response on this point is unconvincing. It would be much more convincing to see the result of a careful inlet calibration.

2) The discussion of the observed CO2 emissions on page 5782-5783 is very vague and confusing. There is a statement that the CO2 emissions differ from those observed at other locations by a factor of two or more which suggests that the fuel economy varies by a factor of two with location which is impossible. In fact, later in the discussion variations in fuel economy are discussed but are far too small to explain the factor of two. On the other hand, the tests done at different locations also used different drive cycles. Even when the authors compare their FTP results to those of others (Table 3), their results refer to only one bag of the FTP test so their results are still not comparable. The authors do not succeed in explaining the huge difference in CO2 emissions that they raise as an important issue. Understanding CO2 emissions should be easy since they are directly and quantitatively linked to fuel consumption.

3) There is too much discussion of gas-electric hybrid technology in the Introduction. Two paragraphs are devoted to a primmer on the topic.

4) The abstract states the following conclusion which is hypothetical and unsubstantiated: "Some difference suggest that an inefficient combustion process and type of gasoline used in the MCMA may be partly responsible for lower CO2 and higher CO and NO emission factors." Also: why would inefficient combustion cause CO2 emissions to be low by a factor of two? Low total carbon emissions imply high fuel economy and more than 98% of the carbon emissions are as CO2.

5) The abstract also states that CO2 emissions obtained in this work are similar to those measured for the same vehicle model elsewhere. On the other hand, as discussed above (2), the paper contradicts this on page 5782 where its states that these CO2 emissions are "a factor of two or more lower than from other studies performed on the Toyota Prius vehicle in other locations."

6) There are no strong conclusions from this paper. This is evident in the Conclusions section which is 24 lines long. Lines 8 through 24 discuss future work - not the work under review. The only two conclusions are that a testing method has been established

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and that one vehicle has been tested in Mexico City (using driving cycles that cannot be directly compared to previous studies).

Interactive comment on Atmos. Chem. Phys. Discuss., 6, 5773, 2006.