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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Emission and chemistry of organic carbon in the gas and aerosol phase at a sub-urban site near Mexico City in March 2006 during the MILAGRO study" *by* J. A. de Gouw et al.

Anonymous Referee #1

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This manuscript describes the organic carbon budget at the T1 site during the MILAGRO field campaign. The authors examine the diurnal variability in both VOC and aerosol observations to identify common formation/processing across the suite of compounds. The relative loss by OH oxidation of anthropogenic VOCs and CO is used to develop a nice analysis of daytime removal, and this is complemented by an examination of the changing total observed organic carbon (TOOC) budget from morning to afternoon. This study does a nice job of comparing to previous work and the analysis is thorough. I recommend it for publication in ACP and have only minor comments below.

1. Page 21269, line 9: The sentence about SOA formation in cloud is a little ambiguous

- if the authors are suggesting this might be an important source of SOA, perhaps they could clarify?

2. Page 21269, line 15: It would be nice to have a few sentences here describing the T1 site and typical met conditions. Particularly if there might be changing wind patterns that might affect the observed diurnal variations in VOCs and aerosols (or to have this ruled out).

3. Page 21273: Could the collection efficiency estimated for the AMS also play a role in the relative positive bias of OC?

4. Page 21274, line 7: Did the authors examine the data for any markedly different behavior in particular weeks, perhaps using a tracer such as WSOC which is available throughout the campaign?

5. Page 21274, line 10: Is the morning peak solely attributable to accumulation in the boundary layer, or is there also a contribution from morning rush hour traffic in Mexico City?

6. Figure 5: Although one expects anthropogenic VOCs and CO to be very correlated in an environment such as Mexico City, I was curious what isoprene vs. CO would look like. Perhaps this could be added to the figure? Was isoprene included in Figure 10? On a related note, given the interest in segregating anthropogenic and biogenic sources, it would be nice to see what fraction of alkenes are made up of isoprene in Figure13.

7. Section 3.3: The discussion here is to highlight that biomass burning is present but not an overly important source of organic carbon at T1. It would be reassuring if the authors repeated their analysis of Section 3.2 and 3.4, 3.5 having filtered out the biomass burning influence (perhaps when $>$ 20% in Figure 8b) to confirm that their results are not influenced by fires. If this has been done, perhaps the authors could add a sentence at the end of Section 3.3 indicating that this has been tested.

ACPD

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Interactive Comment

8. Page 21279, line 28: semantics: CO is not "an inert tracer"

9. Page 21284, lines6-8: how does the enhancement in OM/OC/WSOC/OOA compare with the study by Volkamer et al, 2006 in Mexico?

10. Page 21286, lines 23-24: Aromatic VOCs do not have the highest VOC emissions (eg. isoprene) or the highest smog chamber yields (eg. sesquiterpenes) and would thus not be characterized as the "most important precursor of SOA". Perhaps the authors meant among the precursors measured in this environment? This sentence should be clarified.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 21265, 2008.