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Interactive comment on “Oxidative capacity of the Mexico City atmosphere – Part 2: A RO_x radical cycling perspective” by P. M. Sheehy et al.

Anonymous Referee #2

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Oxidative capacity of the Mexico City atmosphere – Part 2: A RO_x radical cycling perspective

By Sheehy et al.

In their paper, Sheehy et al. present an investigation oriented to analyze the behavior of radical species in the polluted ambient air of Mexico City through the use of a comprehensive explicit box model. The paper is, in general, well written, easy to follow and has a thorough description of the authors' investigation. The issue arise by the authors is relevant and well described. I recommend the paper for final publication, after some issues are addressed.

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General (major) comments:

The paper as it stands, in my opinion, is too long. There are some sections that could be summarized or even dropped-out. For example, the introduction section is too long. The authors list several studies that have addressed HO_x modeling/measurement issues (page 5361, line 25 and on). Then, they proceed to discuss several of them, though it is not clear why they go into details in some of them. I believe that these paragraphs could be summarized into a brief discussion of the fallbacks of the studies and challenges that are being addressed by the paper at hand. Another example is Table 2. This table takes a lot of space, but little is said about it and the values presented. It seems that a summary table with value ranges would be more appropriate.

Explain how the uncertainty ranges for the input variables were estimated, particularly for those species where no corresponding measurements were available (e.g., alkenes were assigned a 25% uncertainty based on speciation profiles, still is not clear why they were assigned this uncertainty level). Are these values consistent with what others have used? Are the estimates a function of the particular urban area being analyzed? Can these estimates represent an important source of overall uncertainty and influence the overall result?

Revise sequence of the manuscript. Figure 1 is first cited on page 5375, after Figures 2-5. In Table 2, presented in section 3.1, values for the "chain length" are listed. However, the definition of chain length is presented in section 3.6.

Page 5381, line 6: What are the implications of having most of the cases that fall outside the experimental uncertainty as P(OH) < L(OH)?

Page 5383-5384, starting from line 25. The paragraph lacks of support. Only the idea of an expanded LN/Q parameters is mentioned, but no real insight is presented. The paragraph should be eliminated.

In the conclusions section there are ideas that were not discussed in any other part of

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the manuscript, and thus lack of support to be included in this section. For example: page 5392, lines 4-8, and lines 26 and on.

Minor comments:

Page 5360; lines 16-18: It might not be clear what is meant by "chemical uncertainty", should it be uncertainty in chemical mechanism?

Revise de use of semi-colons (";") in sentence constructions; there seems to be an "abuse" in its use. Also revise the use of the word "uncertainty". It seems that in some cases the word "error" might be a better selection. There is no need to clarify figure characteristics in the text (e.g., page 5369, lines 23-24, remove "(left)" and "(right)"; this should be in the figure caption). In the same spirit, do not use the figure captions to discuss them, it is redundant with respect to what is included in the text (e.g., Figure 5, Figure 6,

Page 5361: NO and NO₂ are defined in lines 3 and 4; there is no need to redefined them in lines 5 and 6.

Page 5361; line 11. Remove "kick".

Page 5361; line 20: I do not agree with the statement. Please clarify.

Page 5361; line 26: There is a comma missing after Birmingham.

Page 5373; line 25: Should say "missing reactivity".

Page 5374; line 4: Should say "... chemistry and ...".

Page 5375; line 1: Should say "... Fig. 5B ..."

Page 5377; line 8: It says ",... as it is OVOC...". Revise wording.

Table 1. Provide full reference for EPA document. In the Table caption letters A, B and C are assigned but other definitions are added in the table foot note that cause confusion.

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Table 2. "hrs" is missing; define VOC-reac.; define chain length.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 5359, 2008.

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8, S2366–S2369, 2008

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