

Interactive comment on “Sensitivity analyses of OH missing sinks over Tokyo metropolitan area in the summer of 2007” by S. Chatani et al.

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The authors provide an interesting approach for the adjustment of emission inventories. Measurements of the hydroxyl radical (HO) loss rates (reactivity) were available. Air quality model simulations were performed, simulated HO loss rates were calculated and compared with the measured loss. The simulated loss for HO was lower than the measured loss so much of the emission inventory was adjusted upward to match the observations. This adjustment improved the agreement between measurements and the simulations but the agreement was not completely satisfactory.

Most previous attempts to investigate possible deficiencies in emissions inventories have focused on improving agreement between measurements and simulations for photochemical products such as ozone. This approach has some merits because in

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addition to fitting a product like ozone it also including a fundamental radical intermediate such as HO that is at the heart of the chemical mechanism.

The authors point to an important problem with the condensed chemical mechanisms such as CB, SAPRC and RACM type of mechanisms. In general it is difficult to simulate all the loss of the HO radical with a condensed mechanism. By definition a condensed mechanism must “cut off” its treatment of organic degradation pathways at some point and often formaldehyde (or acetaldehyde) is the final product. This over simplification of mechanisms may lead to over predictions of formaldehyde and under predictions of HO loss.

Does the paper address relevant scientific questions within the scope of ACP? Yes
Does the paper present novel concepts, ideas, tools, or data? Yes
Are substantial conclusions reached? Yes
Are the scientific methods and assumptions valid and clearly outlined? Yes
Are the results sufficient to support the interpretations and conclusions? Yes
Is the description of experiments and calculations sufficiently complete and precise to allow their reproduction by fellow scientists (traceability of results)? Yes
Do the authors give proper credit to related work and clearly indicate their own new/original contribution? Yes
Does the title clearly reflect the contents of the paper? Yes
Does the abstract provide a concise and complete summary? Yes
Is the overall presentation well structured and clear? Yes
Is the language fluent and precise? Yes
Are mathematical formulae, symbols, abbreviations, and units correctly defined and used? Yes
Should any parts of the paper (text, formulae, figures, tables) be clarified, reduced, combined, or eliminated? No
Are the number and quality of references appropriate? Yes

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