

***Interactive comment on “Comparisons of
observed and modeled OH and HO₂
concentrations during the ambient measurement
period of the HO_xComp field campaign” by
Y. Kanaya et al.***

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Kanaya et al. presents an analysis of photo-oxidation of isoprene during the HO_xComp field campaign. In the manuscript a simplified oxidation mechanism for isoprene is first revised blending some recent experimental data with other oxidation mechanisms. This model is then used as base model. Then, a simplified representation of the chemistry proposed by Peeters and co-workers has been added. Afterwards, the overestimation of OH and HO₂ by the extended model, in contrast to the revised model alone, is presented as supporting the low bulk isomerization rate of ISO₂ by Crouse et al. (2011).

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The conclusions drawn from the analysis are dependent on the kinetic model that is used. A few potentially critical reactions of the model may weaken the conclusions the authors draw.

The (revised) base model assumes the following unrealistically high OH-recycling in:

(A17) IEPOXO₂ + HO₂ → 1.125 OH + products

Taraborrelli (2010) commented on this reaction and on its representation of ISOPOOH chemistry introduced by Paulot et al. (2009).

In the updated model a potentially significant underestimate of the OH reactivity may originate from the following reactions

(A60) HPALD1 + OH → OH

(A61) HPALD2 + OH → OH

which are in line with what Peeters and Müller (2010) predicted with regard to OH-recycling. However, in A60 and A61 reactions represent a significant flux of reactive carbon that disappears without contributing to the modelled OH reactivity.

References

Paulot, F., et al. : Unexpected Epoxide Formation in the Gas-Phase Photooxidation of Isoprene, *Science*, 325, 730–733, doi:10.1126/science.11729102009, 2009

Peeters, J. and Müller, J.-F. : HO_x radical regeneration in isoprene oxidation via peroxy radical isomerisations. II: experimental evidence and global impact. *Phys. Chem. Chem. Phys.* 10, 14227–14235 (2010)

Taraborrelli, D. : Interactive Comment on "The Chemistry of Atmosphere-Forest Exchange (CAFE) Model – Part 1: Model description and characterization" by G. M. Wolfe and J. A. Thornton, 2010, <http://www.atmos-chem-phys-discuss.net/10/C8885/2010/acpd-10-C8885-2010.pdf>

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