

Interactive comment on “Detection of HO₂ by laser-induced fluorescence: calibration and interferences from RO₂ radicals” by H. Fuchs et al.

H. Fuchs et al.

h.fuchs@fz-juelich.de

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We thank the reviewer for his/her comments and the support for publication of this paper. Here are our responses to the specific comments:

Comment: P1262 L12-17: Did the authors check that a significant fraction of OH was not lost before exiting the calibration source (reaction of OH with gas-phase impurities/wall reactions)?

Response: OH losses are not expected in the calibration source. (1) We sample only a small part (< 5%) from the center of the entire flow which is laminar. The residence time of the sampled flow between the photolysis region and the nozzle orifice is only 20 ms. The OH reactivity of the synthetic air used as a carrier gas is too small (< 1

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s⁻¹) to cause notable OH loss. Likewise, wall loss can be neglected since diffusion is far too slow at atmospheric pressure on the given time scale. (2) OH loss would lead to an overestimation of radical concentrations. However, intercomparison measurements with an OH DOAS instrument did not exhibit any systematic deviations between OH radical concentration (Schlosser et al., J. Atmos. Chem. 2007; Schlosser et al., Atmos. Chem. Phys., 2009). We will add a statement on p1262, l17: “Radical loss inside the radical source does not play a role, since only a small part of the entire flow is sampled from the center of laminar flow.”

Comment: P1270 L24-26: The authors indicate that they recently investigated the prompt yield of HO₂ from the benzene+OH reaction. How do these results compare to the recommended yield of 65%?

Response: The HO₂ yield measured by us agrees well with recommendations. We will update the reference for our paper in PCCP that was published during the discussion period of this paper. We will change our statement on p1270 l16: “We investigated recently the yield of prompt HO₂ formation by directly observing the HO₂ formation and found good agreement (Nehr et al., 2011)”

Comment: P1284 L25-27: “. . . in contrast to assumptions made in the past that the reaction of alkoxy radicals with O₂ suppresses the conversion”: Add references

Response: We will add on p1284 the reference Holland et al., J. Geophys. Res. 2003.

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