Atmos. Meas. Tech. Discuss.,
doi:10.5194/amt-2019-164-RC1, 2019

Atmospheric Measurement Techniques Discussions

Interactive comment on "A New Instrument for Time Resolved Measurement of HO_2 Radicals" *by* Thomas H. Speak et al.

Anonymous Referee #2

Received and published: 14 May 2019

The authors describe an experimental apparatus to determine HO2 yields and OH reaction kinetics in a pump-probe flow-tube experiment. The paper is suitable for publication in AMT after addressing the following points: P1 L19/20: As written now, the statement only verifies the OH kinetics. P2 L41/42: It would be useful to show the explicit reactions. P6 L148: What was the repetition rate of the laser? P8 L182: Which range and which resolution was used for the delay between photolysis and detection?

P8 L201: Could the authors show here or elsewhere that the chemistry stopped, when the air entered the low pressure cells or what the influence on the measurement was, if not?

P11 L246-252: Could the authors give some numbers for the correction?

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Discussion paper

P11 L253-268: The description could be extended by giving more details what exactly is calculated and how calibration numbers are derived. Is an absolute OH calibration of the cells needed for this approach? If so, how was this achieved?

P14 L346: What are the consequences for not so well-known systems? Is there a strategy how to estimate the RO2 fraction in the signal or at least to know, if RO2 influenced the yield?

P15 L357: Could the authors give numbers of the timescales? What fraction of HO2 from R10 would be still seen?

P15 L370: I kindly disagree with this statement. The yield is the difference between the HO2 yields from both experiments has a large error. The value is (10+/-11)% applying error propagation. What would be the additional uncertainty due to potential RO2 interferences and the fraction of HO2 from R10 (see comment above)?

P16 Section 3.3: The description would benefit from a discussion about the reproducibility of these effects and their impact on the accuracy of results for experiments.

Figure 6/7: The authors should make clear, which experiments are shown in these figures.

Table 3: The table is not correctly displayed.

The authors might somewhere discuss the approach used in Nehr et al., PCCP, 2002 to determine HO2 yields.

General remark to the figures: It would be easier to work with legends instead of descriptions in the captions.

Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2019-164, 2019.