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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Atmospheric isoprene ozonolysis: impacts of stabilized Criegee intermediate reactions with SO_2, H_2O and dimethyl sulfide" *by* M. J. Newland et al.

Anonymous Referee #1

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The authors have used the EUPHORE chamber to measure the loss of SO2 during isoprene ozonolysis as a function of relative humidity and dimethyl sulfide (DMS) concentration. This enabled the determination of quantities such as the yield of stabilized Criegee intermediate (SCI), the relative rate coefficients for the reaction of SCI with H2O vs. with SO2, and the relative rate coefficients for the reaction of SCI with DMS vs. with SO2. The authors found a SCI yield of 0.56 $\pm$ 0.03, in good agreement with a recent experimental estimate by Sipilä (Atmos. Chem. Phys. 2014, 14, 12143) based on H2SO4 formation and an older theoretical estimate by Zhang (Chem. Phys. Lett. 2002, 358, 171). The derived relative rate coefficients allow the authors to conclude

that reaction with water is the main sink for isoprene-derived, and that SCI may be a significant DMS oxidant at dawn and dusk, when both [OH] and [NO3] are low. Overall, I judge the paper to be of high quality. The experimental work and data analysis have been done carefully, and the authors have been transparent about their methodology. The relevant literature has been thoroughly cited and discussed fairly. Moreover, the subject matter treated by the manuscript is clearly important in that it provides evidence that the stabilized Criegee intermediate derived from isoprene ozonolysis will likely not be a significant oxidant of SO2.

One suggestion: Since the authors cite the Hasson (2001) isoprene-SCI yield of 0.27 (in Table 1), they should try to account for the discrepancy between the present result and this earlier result.

I have no technical corrections to note.

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 8839, 2015.