Atmos. Meas. Tech. Discuss.,
doi:10.5194/amt-2018-99-RC1, 2018

Atmospheric Measurement Techniques Discussions

Interactive comment on "A novel semi-direct method to measure OH reactivity by chemical ionisation mass spectrometry (CIMS)" *by* Jennifer B. A. Muller et al.

Anonymous Referee #1

Received and published: 15 May 2018

A novel semi-direct method to measure OH reactivity by chemical ionisation mass spectrometry (CIMS)

Jennifer B.A. Muller et al., Atmos. Meas. Tech. Discuss., doi: 10.5194\amt-2018-99

The authors present the development, characterisation and implementation of a novel instrument to make long-term measurements of OH reactivity (kOH) at the Global Atmosphere Watch (GAW) site at Hohenpeissenberg, Germany.

OH reactivity is a key measurement in atmospheric science, representing the total OH loss rate and used to provide valuable information regarding the oxidising capacity of the atmosphere. However, long-term measurements of such a key contribution to our

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understanding of atmospheric composition are currently lacking owing to the complexity of the majority of techniques used to measure this parameter. This work makes therefore makes a significant contribution to the field by describing the adaptation of an existing technique to make long-term measurements.

The paper is generally well-written, and the instrument and its characterisation are well described. While there are significant limitations to the application of the technique to certain environments, these limitations are discussed in detail, with supporting model calculations to provide confidence in the intended application of the technique for long-term measurements in a relatively clean location. I therefore recommend publication after minor comments (listed below) have been addressed.

Page 1, line 13: Please consider re-phrasing 'between below 1 and 40', perhaps to 'from less than 1 to 40'.

Page 1, line 27: 'termed also' to 'also termed'.

Page 3, line 17: 'produced O(1D)' to 'O(1D) produced' (also subscript in CF2 above).

Page 6, Section 3: Is there any potential for photolysis of carbonyl compounds? What would the impact be?

Page 8, line 12: Remove 'such' in 'such e.g. OH. . .'.

Page 9, line 26: Change to 'a range of VOCs and calculated OH reactivity'.

Page 9, line 29: Can you comment on how long 'extensive flushing' is required for?

Page 10: Is it possible for future experiments to purify the SO2 used?

Page 12, line 28: 'from reaction chain' to 'from the reaction chain' (both instances).

Page 13, line 3: Is this the rate or the rate coefficient?

Page 14, line 17: 'inorganic species'.

Page 15, line 20: 'systemacity in errors' to 'systematic errors'.

Page 17, line 3: ‘fit parameter’ to ‘fit parameters’.

Page 17, line 12: Please re-phrase ‘highly performant’.

Page 19, line 10: ‘. . .observed to have a clear diurnal. . .’.

Page 19, line 12: ‘. . .dominance of biogenic VOCs in summer is contrasted by higher concentrations. . .’.

Page 19, line 31: ‘a representative ambient air sample’.

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