

Interactive comment on “Study of OH-initiated degradation of 2-aminoethanol” by M. Karl et al.

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This paper is very interesting because it addresses the atmospheric chemistry of a compound that may have future significance. The paper illustrates some aspects of the utility and problems of large environmental reaction chambers for examining gas-phase reactions that are involved with aerosol formation.

MES, 2-Aminoethanol, is important because of its potential use as a solvent for the capture of carbon dioxide. The rate constant for its gas-phase reaction with the hydroxyl radical (HO) is an important determinate of its fate in the atmosphere. The authors performed two measurements of this rate constant with the EUPHORE reaction chamber. The EUPHORE reaction chamber is an excellent research tool for the measurement of rate constants, product yields, gas-particle conversion and similar properties. The chamber was very well instrumented for the authors' research.

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Interactive Discussion

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This paper provides interesting and useful data on a previously unmeasured rate constant and the formation of aerosols produced from MES. There are also problems with large chamber studies that are illustrated by this paper. The first is that there are only two chamber runs that contribute to the measurement of the HO rate constant. Presumably this is due to the large effort and expense of a EUPHORE chamber run. The second difficulty is the need to fit a relatively complicated system where other oxidants, such as nitrate radical, may be an unmeasured interference. Wall effects are another important uncertain factor in fitting the data. One very positive aspect of the chamber is its relatively large size that should provide aerosol data that is more applicable to ambient conditions.

The results show that structural-reactivity estimates of the HO rate constant with MES may be inaccurate by a large factor. This observation should encourage more accurate measurements of this rate constant. The observations of the formation of aerosol and further experiments should be done to better quantify the factors affecting nucleation and their growth.

The reviewer suggests that the authors highlight the uncertainties in the results given that only two measurements were made. Perhaps a more extensive errors analysis and / or sensitivity analysis could be included.

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 27763, 2011.

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