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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Aqueous phase oxidation of sulphur dioxide by ozone in cloud droplets" *by* C. R. Hoyle et al.

Anonymous Referee #1

Received and published: 13 January 2016

This manuscript demonstrates the first application of the CLOUD chamber for the study of aqueous chemistry in cloud droplets. The authors present low temperature (-10 C and 10 C) measurements of aerosol formation by SO2 and O3 under simulated cloud conditions in the chamber, and detailed model analysis of the results. The main result is the confirmation of previously published rate data at these temperatures. I recommend publication of this manuscript in ACP after minor revisions. For the most part my technical comments echo the statements of Reviewer #2 so I will not repeat them.

- Did the authors compare the E-AIM predictions for NH3 closure with those of another thermodynamic model, such as ISORROPIA?

- This manuscript contains an overload of data and information. My recommenda-

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tion is that technical figures that go towards characterizing the chamber rather than experimental data, such as figures 1 and 2, be moved to an online supporting information document. Tables 4 and 5 likewise contain far too much information and could be moved to the SI. A shorter table could be presented that highlights only specific experiments which are discussed in the modeling section.

- Finally, the glyoxal experiments presented here are an afterthought, serving more as a proof of concept rather than providing new insight. It is my assessment that they should be removed from this manuscript, expanded upon, and published separately.

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 33843, 2015.

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