

Atmos. Chem. Phys. Discuss., community comment CC1
<https://doi.org/10.5194/acp-2021-58-CC1>, 2021
© Author(s) 2021. This work is distributed under
the Creative Commons Attribution 4.0 License.

Comment on acp-2021-58

Krzysztof Rudzinski

Community comment on "Acidity and the multiphase chemistry of atmospheric aqueous particles and clouds" by Andreas Tilgner et al., Atmos. Chem. Phys. Discuss.,
<https://doi.org/10.5194/acp-2021-58-CC1>, 2021

This is a very interesting paper tackling an important aspect of atmospheric chemistry.

I would like to draw the authors' attention to our paper on isoprene oxidation coupled with manganese catalyzed autoxidation of sulfite (1), which is matching section 4.4. That paper shows the influence of acidity on the rate of autoxidation and on the rate of isoprene conversion based on experimental observation and detailed kinetic modelling. The kinetic model used includes autoxidation of Mn(II), autoxidation of S(IV) catalyzed by Mn and oxidation of isoprene. It explains the observed influence of pH on the reactions (with and without isoprene present) better than empirical rate equations shown in section 4.4.

Our another paper (2) describes the aqueous-phase transformation of isoprene in the presence of HONO. Also in this case the acidity of solutions had significant effect on the isoprene conversion demonstrated by experiments and explained by a model. However, in this case the role of acidity was simple - conversion of isoprene required undissociated HONO present.

The authors might consider using the quoted papers as a minor illustration to their valuable lecture.

with best regards

Krzysztof J. Rudziński

(1) Rudziński KJ, Gmachowski L, Kuznietsova I (2009) Reactions of isoprene and sulphydryl radical-anions – a possible source of atmospheric organosulphites and organosulphates Atmos Chem Phys 9:2129-2140 doi:10.5194/acp-9-2129-2009

(2) Rudziński KJ, Szmigielski R, Kuznietsova I, Wach P, Staszek D (2016) Aqueous-phase story of isoprene – A mini-review and reaction with HONO Atmos Environ 130:163-171 doi:<http://dx.doi.org/10.1016/j.atmosenv.2015.12.027>