Atmospheric Chemistry and Physics Discussions

Atmos. Chem. Phys. Discuss., referee comment RC1
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Comment on acp-2022-309 Please check rate constant

Anonymous Referee #1

Referee comment on "Emission factors and evolution of SO_2 measured from biomass burning in wild and agricultural fires" by Pamela Rickly et al., Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2022-309-RC1, 2022

This paper reports the surprising result that HMS can act as a sulfur reservoir by conversion of HMS back to bisulfite and/or sulfite on relatively short time scales. The reaction describing this conversion is given in Table S1 and the work of Song et al. (2021) (and references therein) is referenced. In this paper's Table S1 the pre-exponential factor for the rate of HMS loss by this reaction is 6.2 x 10 +8 , however, in Song et al the factor is k = 6.2 x 10 -8, a difference of 16 orders of magnitude. Maybe this is a typo, or maybe it explains the unexpected short lifetime of HMS? It would be optimal for the authors to address this issue prior to a full review of the paper since it impacts a large portion of the manuscript.