

Interactive comment on “Mechanism of UV-light induced SO₂ oxidation to H₂SO₄” by A. Sorokin

Anonymous Referee #2

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The manuscript (Mechanism of UV-light induced SO₂ oxidation to H₂SO₄ by A. Sorokin) presents an interesting possible path for the missing sulfuric acid concentration if only the OH-path in the atmosphere is taken into account. Unpublished results from laboratory and field campaigns with measured and modeled OH and sulfuric acid concentration show a clear underestimation of H₂SO₄ although the OH concentrations seem to fit taking the measurement uncertainties into account. There is a lack of knowledge the community face in this topic and the manuscript provides a reasonable possible explanation. I would consider the manuscript to be nearly ready for publication in the way it is. However, the very detailed comments by referee 1 (specific and technical) have to be taken into account.

The most important result for the atmosphere community by the manuscript seems to be the high source of GSA through R8. The uncertainty of this part seems to be the assumption of the very high rate coefficient on page 24419 line 6. This value as

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pointed out by referee 1 has to be explained and discussed more in detail because it brings the conclusion that at least in the FR the production of GSA is approximately the same for OH and excited Oxygen reactions with SO₂. Just to mention that the rate coefficient were assumed is not enough when we consider the high impact it could have for the atmosphere chemistry.

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 24411, 2009.