

Interactive comment on “Isoprene, sulphony radical-anions and acidity” by K. J. Rudziński et al.

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General comments:

This study shows that isoprene is able to react with sulphony radicals, giving rise to novel oxygenated isoprene derivatives, which could serve as precursors for organosulphates that have recently been reported in several laboratory and field studies. As discussed in the manuscript, it is still not clear how organosulphates are formed since direct esterification of alcohols does not seem to be kinetically feasible. The proposed reaction with sulphony radicals could indeed play a role in the formation of organosulphates in aqueous systems. In this respect, I would like to draw attention to a recent study (Galloway et al., ACPD 8, 20799-20838, 2008), which demonstrated that sulphuric acid alone was not sufficient to generate the sulphate adduct of glyoxal but that

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irradiation (likely responsible for the formation of reactive sulphate radical anions) was also required.

I have found this an interesting study which provides novel insights into the complex chemistry of reactive sulphate species and their potential in the formation of organosulphates.

Specific comments:

P. 20870 - I. 10, 11, 12: I suggest to provide nominal m/z values, since the accuracy of the low mass resolution measurements is probably about 1 unit.

P. 20870 - I. 13: I would write: "... by electrospray ionisation mass spectrometric analysis".

P. 20871 - I. 2: something is missing in this sentence; do the authors perhaps mean "... in the gas-phase as well as in heterogeneous and multiphase processes."?

P. 20871 - I. 17: I suggest to provide the following references after "... of some of them.": Surratt et al., 2007a,b; 2008. Please note that the Surratt et al. 2008 reference only recently became available. Ref.: Surratt, J. D., Gómez-González, Y., Chan, A. W. H., Vermeylen, R., Shahgholi, M., Kleindienst, T. E., Edney, E. O., Offenberg, J. H., Lewandowski, M., Jaoui, M., Maenhaut, W., Claeys, M., Flagan, R. C., and Seinfeld, J. H.: Organosulfate formation in biogenic secondary organic aerosol, *J. Phys. Chem. A*, 112, 8345-8378, 2008.

P. 20873 - I. 9: I also suggest to mention here that the spectra were obtained in the negative ion mode: "Post-reaction solutions were analysed off-line and in the negative ion mode using....".

P. 20875 - I. 25, 26, 27 and p. 20876 - I. 1: same comment as above about nominal m/z values. Furthermore, as an organic mass spectrometrist I would be more precise here and write: "Electrospray ionisation mass spectra of post-reaction solutions contained peaks of deprotonated molecules that could be attributed"

P. 20876 - I. 5: same comment as above about references: Surratt et al., 2007a; 2008.

P. 20894 - Fig. 6: also here I suggest to provide nominal m/z values. In addition, I suggest to be more precise in the legend about the type of mass spectra: "... appeared in negative ion electrospray ionisation mass spectra of post-reaction solutions."

Technical corrections:

P. 20870 - I. 3: over a broad range

P. 20870 - I. 13: The experimental results

P. 20870 - I. 21: the distribution

P. 20871 - I. 15: methyltetrols

P. 20871 - I. 16: organosulphates

P. 20871 - I. 21: Surratt

P. 20871 - I. 25: Surratt

P. 20871 - I. 25: a recent experimental

P. 20872 - I. 18: to obtain the desired

P. 20872 - I. 20: a small amount of

P. 20873 - I. 10: electrospray ionisation

P. 20874 - I. 23: the dimensionless

P. 20875 - I. 4: a different manner

P. 20875 - I. 21: a broad peak

P. 20876 - I. 5: Surratt

P. 20877 - I. 14: oxidation

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P. 20878 - I. 25: Alkyl radicals

P. 20879 - I. 9: the respective reaction

P. 20880 - I. 19: kinetic experiments

P. 20882 - I. 27: the title of the reference should be written in lower case

P. 20882 - I. 14: Gelencsér

P. 20897 - legend Fig. 9: constants

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 20869, 2008.

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