

Interactive comment on “Organosulfates in atmospheric aerosol: synthesis and quantitative analysis of PM_{2.5} from Xi’an, Northwest China” by Ru-Jin Huang et al.

Anonymous Referee #2

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This manuscript reports the synthesis for nine organosulfates, including phenyl sulfate, 3-methylphenyl sulfate, benzyl sulfate, 2-methyl benzyl sulfate, 3-methyl benzyl sulfate, 2,4-dimethyl benzyl sulfate, 3,5-dimethyl benzyl sulfate, hydroxyacetone sulfate, and glycolic acid sulfate. Four standards were then used to optimize a UPLC-ESI-MS/MS method for identification and quantification of organosulfates. The novelty of this study lies in the application of the method to PM_{2.5} samples collected in urban air in Xi’an which is heavily polluted during winter, demonstrating the usefulness of the method. The authors primarily examined the potential of organosulfate formation only under wintertime conditions, which likely limits the influence of biogenic VOCs on organosulfate formation. The striking result of this study is the highest concentration of

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glycolic acid sulfate in Xi'an, even higher than those reported in previous studies. This study suggests that glycolic acid sulfate is likely formed from anthropogenic VOCs in urban air in the presence of acidic sulfate aerosols.

Overall, the study is well done with all necessary details and the manuscript is well written. The authors provide a state-of-the-art overview of the knowledge in this field. The synthesis procedure of organosulfate standards is robust and well described. The UPLC-ESI-MS/MS is also well optimized. The organosulfate synthesis and the UPLC-MS method, though they are not completely new, are important and certainly adds to the quality of the field measurements. I recommend publication after minor revision.

Specific comments: 1. Organosulfate formation is very important under summer conditions, particularly due to the role of aqueous chemistry in producing sulfate which is essential for organosulfate formation. Why did the authors focus on winter conditions only? 2. In Figure 3, there is additional peak at RT of about 2.1 min in the ambient sample for glycolic acid sulfate? Please explain.

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