

Atmos. Chem. Phys. Discuss., referee comment RC2
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Comment on acp-2021-364

Anonymous Referee #2

Referee comment on "Formation of condensable organic vapors from anthropogenic and biogenic volatile organic compounds (VOCs) is strongly perturbed by NO_x in eastern China" by Yuliang Liu et al., Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2021-364-RC2>, 2021

This paper discussed the measurements of oxygenated organic molecules (OOMs) performed in Nanjing in eastern China. A nitrate-ion-based chemical ionization mass spectrometer was used to perform these ambient measurements, and source apportionment analysis was performed using a recently developed approach positive matrix factorization on binned mass spectra (binPMF). The authors reported several factors related to anthropogenic VOCs daytime chemistry and biogenic VOCs (BVOCs) chemistry, and they discussed the influences of anthropogenic and biogenic emissions on the formation and evolution of these factors. In general, the manuscript was very well-written and the results were presented in a very clear, coherent manner. The topic is of interest to the atmospheric community. I recommend publication after the authors have addressed the following comments:

- More details need to be provided for the quantification of OOMs (equation 1) especially since OOMs are the focus of this paper. How was equation 1 derived?
- Why did the authors assume that the detected OOMs have the same ionization efficiencies as sulfuric acid? Have they tested their assumption? What are the uncertainties that arise from using this assumption?
- The authors stated that VOCs were measured using a PTR-MS. Was the data used in this paper? It was not clear to me whether and/or how the data was used to support results discussed in this paper.
- More details need to be provided for equation 2. How was CS calculated?
- Were calibrations performed during the field campaign? If no, how confident are the authors that the ionization efficiencies for their nitrate-ion-based CIMS source were constant throughout the entire sampling period?
- Higher resolution figures are needed.