

Atmos. Chem. Phys. Discuss., referee comment RC1  
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## Comment on acp-2021-364

Anonymous Referee #1

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Referee comment on "Formation of condensable organic vapors from anthropogenic and biogenic volatile organic compounds (VOCs) is strongly perturbed by NO<sub>x</sub> in eastern China" by Yuliang Liu et al., Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2021-364-RC1>, 2021

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This manuscript utilized an improved source apportionment approach that has been developed recently, binPMF, to deconvolve nitrate CI-API-TOF mass spectra from a highly-developed, densely-populated urban region in eastern China. The authors identified factors from different sources and discussed the influence of anthropogenic and biogenic emissions. Overall, the manuscript is well written and scientifically interesting. I recommend publication after the following comments are addressed.

- All figures have a poor resolution. Formatting issues? Please update.
- Equation 1: Can the authors provide more details about calibration factor determination? Are the inlet configuration and flow rate in the reference the same as these used in this work? Moreover, the reagent ion can have different sensitivities towards different compounds, and the sensitivities also vary for ions from the same species but charged in different ways. Can the authors validate the use of H<sub>2</sub>SO<sub>4</sub>-based calibration factor for all species and elaborate more about the potential impact on the results?
- Equation (2): Can the authors include more details of the equation, i.e. how CS is calculated,  $k_{\text{OH}+\text{SO}_2}$  value (or calculation) and source?
- Line 212: "the raw spectra with were..." Some words seemed missing here.
- Figure 1: Can the authors add the diurnal patterns of all parameters? The NO, temperature, and J(O<sup>1</sup>D) diurnals were included in Figure 4 and 12, but it would be good to have a summary plot.
- Table 1: As mentioned before, the authors may need to consider the effects of assuming a constant ionization efficiency. How credible are the reported concentrations? Can the authors include uncertainties?
- Line 341: The authors used "autoxidation" instead of "auto-oxidation" elsewhere. Please be consistent. Moreover, the diurnal pattern of Aro-OOMs almost followed that of NO, would autoxidation be suppressed?
- Figure 8: One obvious difference between the two isoprene oxidation products from this figure is that C<sub>5</sub>H<sub>10</sub>O<sub>8</sub>N<sub>2</sub> was mostly attributed to Isop-OOMs and Photo-related factors, while C<sub>5</sub>H<sub>9</sub>O<sub>10</sub>N<sub>3</sub> was to Isop-OOMs and Ox & SOA-related factors. As the authors proposed that C<sub>5</sub>H<sub>9</sub>O<sub>10</sub>N<sub>3</sub> was more likely to be transported than C<sub>5</sub>H<sub>10</sub>O<sub>8</sub>N<sub>2</sub>, does this imply that the Ox & SOA-related factor was transported?

