

Response to RC6:

The report studied molecular composition and source contributions of PM_{2.5} during winter hazy days. The ¹⁴C measurements of WSOC and further characterization of organic matters reveal that biomass burning is an important driver for the haze formation, in contrast to the fossil-dominated “normal” situation in Nanjing in winter. The findings are interesting to the atmospheric chemistry community. The manuscript is generally well-written and presented with solid evidence. It has both values regarding molecular-level characterization and source tracking. I would like to recommend accepting this manuscript for publication in ACP after addressing the following comments.

We appreciate the reviewer’s feedback on the manuscript, and we carefully reviewed the comments and addressed each individually below, highlighting changes made to the revised manuscript.

Major:

1. The title can be changed to “Significant role of biomass burning in heavy haze formation in Nanjing, a megacity in China: Molecular-level insights from intensive PM_{2.5} sampling on winter hazy days”.

Thanks. We have changed.

2. The main contribution of biomass burning is likely related to significant chlorine emissions, which was reported by Chang et al. 2024 (*National Science Review*, nwae285, <https://doi.org/10.1093/nsr/nwae285>) to affect the long-term atmospheric chemistry and air quality in Asia. The authors can compare this work with the study by Chang et al. to support these findings in the manuscript.

Thanks very much for your suggestion. We have added additional descriptions about this reference paper to provide more evidence in the revised manuscript, specifically in lines 302-304, 451-453, 533-535 and 549-550.

Minor:

1. The pie charts in Figure 1 are a little blurry.

Thank you for pointing that out. We have improved the resolution of the pie charts in Figure 1 to ensure they are clearer in the revised manuscript.

2. Keep the font size in the figure legend consistent (e.g., Fig 4)

Thanks. We have changed the font size in the figure legends throughout the manuscript, including Figure 4.