



EGUsphere, referee comment RC1
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Comment on egusphere-2022-247

Anonymous Referee #1

Referee comment on "Sources and processes of water-soluble and water-insoluble organic aerosol in cold season in Beijing, China" by Zhiqiang Zhang et al., EGU sphere, <https://doi.org/10.5194/egusphere-2022-247-RC1>, 2022

The manuscript by Zhang et al. characterized water-soluble organic aerosol (WSOA) and water-insoluble organic aerosol (WIOA) using a high-resolution aerosol mass spectrometer (AMS) in the cold season in Beijing. The sources, day-night differences, elemental composition, and the roles of WSOA in haze formation were investigated. They found that WSOA accounted for a larger fraction than WIOA (59% vs. 41%) in OA, and comprised the major part of SOA (69%). Particularly, they presented, for the first time, a study of the high-resolution mass spectra of WIOA by integrating simultaneous online and offline AMS measurements. The WIOA was characterized by prominent hydrocarbon ions series and low oxygen-to-carbon (O/C), which provides new insights into the sources and composition of WIOA in urban Beijing. Overall, this manuscript is well written and I recommend it for publication after minor revisions.

Comments:

- Because WIOA was obtained from the difference between OA and WSOA. The uncertainty of WIOA depends on the fraction of WIOA in OA, and could be very high. However, the uncertainty of 3.4% in line 125 seems not reasonable, could the authors show more details on the changes of uncertainties of WIOA as a function of the concentrations or mass fractions of WIOA?
- Did the authors collect blank filters and analyze them with the AMS?
- How were PAHs determined? Please give more details in the measurement or data analysis section.
- The N/C (line 189) and O/C (line 243) ratios were different from those presented in Fig. 5. Please have a check.
- The high f_{55}/f_{57} (2.37) of LOA in line 266 could also support that LOA factor was likely from local cooking emissions. I suggest that a part of this discussion should be presented in the section 3.2.
- Line 237: It would be better to mention m/z 44 and O/C of WIOA during nighttime as well.

- Line 25: Please provide the full name of H/C at the first appearance.