EGUsphere, referee comment RC2
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# Comment on egusphere-2022-247

Anonymous Referee #2

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., EGUsphere, https://doi.org/10.5194/egusphere-2022-247-RC2, 2022

Zhang et al. present measurements of WSOA and the WIOA in Beijing during the cold season. They do this using a combination of online and filter-based measurements. Their measuring suite is very complete and their analysis thorough. I would suggest accepting the manuscript as is but have a few small comments:

Line 88: The authors use argon to atomize extracted filter samples. I understand that this reduces interferences by N2 and O2 fragments during AMS measurements, however, it is not a common practice in AMS or ACSM use. The author should cite a relevant reference on the use of Argon and effects it may have on quantification. The authors could also expand on this experimental method, for example, if any of the instrument's calibrations need to be adjusted for the use of a different carrier gas.

Line 120: The authors calculate WIOA by multiplying the AMS OA(PM1) by 1.5 and substracting the WSOA obtained from offline PM2.5 filter collections. They argue that 1.5 is a good number based on the slope of the offline and online measurements presented in figure S3b. I would argue that this slope is driven by some rather high concentration points and that the uncertainty in this slope is rather large. The authors should calculate the uncertainty in this slope and apply it in their error calculations.

Line 124-125: The errors in WIOA are likely much larger than represented in these sentences. There will be significant error in the slope used to account for PM1-PM2.5 differences. The authors should explain how this error is calculated and incorporate the uncertainty in the slope of figure S2b into their error calculations.

Line 238: The bigger presence of alkyl fragments at night could also be due to repartitioning due to temperature effects, not just differences in oxidation

Line 242: I would say these ratios are identical within uncertainty.