

The manuscript by Qin et al. analyzed an HR-ToF-AMS dataset that was collected at a downwind site of Guangzhou along with co-located measurements. Positive matrix factorization (PMF) with ME-2 algorithm was used to identify the major sources of organic aerosols (OA). Particularly, the traffic-related hydrocarbon-like OA was able to be separated and quantified while it cannot be by the unconstrained PMF. The authors then highlighted the importance of traffic emissions in contributing to HOA and nitrate formation at this site. Also, the secondary organic aerosol formation was investigated using SOA vs O_x ratios. While this topic fits within the scope of ACP, this manuscript needs a major revision, particularly, some parts are written hastily and need to be clarified.

Major comments:

1. The abstract and conclusions claimed a 40% contribution of HOA to organics, which was not discussed in the text at all. Highlighting such a number could be very misleading as Figure 6 shows that the average HOA contributes ~10-30% to OA in both Nov. and Dec.
2. What the size cutoff for the MARGA measurements? The authors analyzed HR mass spectra below m/z 200, but all mass spectra profiles in the manuscript did not show the signals at $m/z > 100$. Did the authors use all m/z 's or just $m/z < 100$ for PMF analysis? Were V-mode or W-mode spectra used for PMF analysis and elemental analysis?
3. The authors used more than two pages to describe PMF-ME2 analysis. Although this analysis is pretty nice, most of which can be moved to the supplementary. Otherwise, this part will dilute the focus of this study.
4. The authors used $[NH_4^+]/[SO_4^{2-}]$ to interpret the formation of nitrate, then the authors need to address the largest discrepancies of NH_4^+ measurements between AMS and MARGA (slope = 0.7, while 0.9-1.0 for sulfate and nitrate), and the potential influences.
5. The subtitles of 3.2-3.4 are not appropriate for the discussions below.
6. The descriptions of elemental analysis in section 3.2 are better moved to the section 2.3.
7. The mass spectral profiles in Figure 4 are very confusing. The authors need to use ion-speciated spectra and add different ion families to each other. The similar figures in supplementary also need to be revised.

8. One of the focuses of this study is HOA. It is clearly not the important discussions in section 3.2 organics, unfortunately. Also, please check the average contributions of OA in Figure 5. The average contribution of HOA is 26%, which is not consistent with the average diurnal fractions in Nov. and Dec. in Figure 6. In addition, it is better to show two pie charts by comparing the average OA composition between Nov. and Dec.