

The manuscript by Wang et al. reported the concentrations of molecular compounds and stable carbon isotopic ratio of oxalic acid before, during and after APEC. The results showed that the concentrations before APEC were much higher than those during APEC, which are overall consistent with the conclusions from previous studies. The authors further investigated the differences in secondary aerosol formation among these three periods. The data presented in this study is helpful to evaluate aerosol chemistry changes during a unique period in Beijing. I have several comments which need to be addressed before its publication.

My major concern is the focus of this study. The authors emphasized the focus in the abstract with “the impacts of the emissions controls on aerosol composition and formation”. However, the authors failed to address how important the emission controls are in decreasing aerosol species during APEC, and how important the meteorological conditions are leading to these changes although there are several discussions. In addition, some data and analysis presented in this study need to be further validated, see my comments below.

Comments:

1. Line 58: define TDOC
2. A mass closure analysis is needed. As indicated by Figure 1, the sum of sulfate, nitrate, ammonium, OC and EC in (d) and (e) is clearly much higher than PM_{2.5} in (c). The authors need to address these differences.
3. The SO₂ data in Figure 1 is also suspicious. Higher SO₂ concentration after APEC is expected due to the influences of coal combustion. However, we didn't see such a trend in Figure 1 although Table 1 did. Please refer to Wang et al. (2015, JGR, Changes in atmospheric composition during 2014 APEC conference in Beijing).
4. Line 177-178: Table 1 did not show OC/EC ratios. Also, it is a bit surprising that OC/EC has no significant differences among the three periods with largely different source emissions. The authors need to clarify this.
5. Line 242: $[\text{NO}_3^- + \text{SO}_4^{2-}]$ is confusing. Is it $[\text{NO}_3^-] + [\text{SO}_4^{2-}]$ or $[\text{NO}_3^-] + 2*[\text{SO}_4^{2-}]$?

6. Figure 5: I strongly suggest that the authors separate the data points into three periods, i.e., before, during, and after-APEC. The fitting can be performed for the whole data.
7. The definition of air mass types is not accurate. The air masses from the south are not necessarily polluted although they do for most of the time. Suggest changing the definitions.
8. The back trajectory analysis was calculated at 00:00 UTC for each day, which means you have only 47-48 trajectories for cluster analysis. The statistics for each clusters could be a problem. Particularly, air masses can have significant changes in one day in Beijing. The authors need to validate this, or calculate the trajectories every 4 or 6 hours. In addition, the time of back trajectories in Figure S4 is not consistent with others.