Comments to " The importance of biomass burning in light extinction and direct radiative effect of urban aerosol during the COVID-19 lockdown in Xi'an, China" by Tian et al.

The paper by Tian et al. investigated the impacts of anthropogenic sources on b_{ext} and direct radiative forcing (DRF). They found out that biomass burning dominated b_{ext} and DRF during the COVID-19 lockdown in Xi'an, China. This paper is well-written and topical. However, some important details on the measurement methods and data analysis method are needed. Furthermore, some results require further interpretation. I suggest that this paper will be published in ACP after addressing the points listed below.

1. The mass concentrations of ions, OA were measured in PM_1. In fact, considerable fractions of them might be distributed in $PM_{1\text{-}2.5}$, especially during the polluted period in north China. Thus, ions and OA in $PM_{2.5}$ should be underestimated. I suggest author reconstruct the $PM_{2.5}$ mass based on these measured chemical compositions to discuss their uncertainties.

2. The uncertainties of estimated MSEs and MAEs of chemical compositions in table 2 should be large due to the comment 1.

3. Generally, the formation mechanisms of NH_4NO_3 and $(NH_4)_2SO_4$ might be related with aqueous chemical processes. In Mie theory, their MSEs might be similar due to their similar size distributions. However, why their estimated MSEs are very different especially during the normal period?

4. I suggest the author to further analyze the possible source or formation mechanisms of LO-OOA and MO-OOA. At least it needs to be discussed whether these OOAs came from the oxidation of POA or directly from the oxidation of VOCs. According to the estimated MSEs of POA, LO-OOA and MO-OOA, mass median diameter of POA might be evidently lower than those of LO-OOA and MO-OOA. Why the MSEs of LO-OOA and MO-OOA is higher than that of POA needs further discussion. In addition, why the MSE of MO-OOA during the lockdown period is higher than that during the normal period also needs further discussion.

5. The combined contribution of POA, LO-OOA and MO-OOA to b_{ext} was over 60% and the combined contribution of NH_4NO_3 and $(NH_4)_2SO_4$ was over 20% during the during the lockdown period in Fig.4. In contrast, the contribution of biomass burning to b_{ext} was only 37% during the lockdown period in Fig.6. This means that secondary organics and secondary inorganics from gaseous precursors (e.g., SO_2, NOx and VOCs) emitted from coal combustion contributed slightly more to b_{ext} than biomass burning. Therefore, controlling biomass burning is as important as coal combustion in this city.

6. The contributions of six sources to DRE were estimated under the dry condition. To some extent, the contribution of coal combustion to b_{ext} might be significantly higher than that of biomass burning under ambient RH condition due to the hygroscopic growth according to comment 5.