

This manuscript presents a comprehensive measurement study at Seoul during wintertime using a suit of on-line instruments including a HR-ToF-AMS. It is found that the mass concentration of submicron aerosol was high and exceeded the national air quality standard. The chemical species showed evidently diurnal variation suggesting the local and/or regional sources which mainly derived by local weather condition or regional weather systems. The study also found important primary sources and secondary formation pathway for organic aerosol which is important for mitigation for the government. The manuscript is general well done and the data processing is reasonable and thoughtful. The topic of this study is also fitted in the topic of this special issue of ACPD. I recommend it is accepted after a minor revision as followed.

1. The elemental ratio of S/C is generally not used in the reported data because the correcting factor of S/C for ambient data was not well done.

2. Please clarify how PAH was determined? Is it based on default fragmentation or W-mode data?

3. Page11, line 16-18: does any reference to support this point?

line 25-28: please cite this reference:

Xu, J., Zhang, Q., Chen, M., Ge, X., Ren, J., and Qin, D.: Chemical composition, sources, and processes of urban aerosols during summertime in northwest China: insights from high-resolution aerosol mass spectrometry, *Atmos. Chem. Phys.*, 14, 12593-12611, 10.5194/acp-14-12593-2014, 2014.

4. Figure 9: please remove “high-resolution mass spectra of” in the caption.

5. Figure 10: add “+” in each category family.