

The manuscript by Ye et al. had a comprehensive analysis of fine particle composition in a city in Yangtze River Delta using a suite of analytical instruments including a SP-AMS. This is also one of a few studies in China to do offline analysis of aerosol particles using aerosol mass spectrometry. The data and results are clearly important for a better understanding the sources, seasonal variations, and formation mechanisms of aerosol particles in this polluted region. I recommend it for publication after addressing the following comments.

The authors assume $\text{CO}_2^+ = \text{CO}^+$ in calculating elemental ratios because of the influences of inorganic carbonate. The authors can have a better evaluation of the relationship between CO^+ and CO_2^+ by showing a scatter plot. The reason is 1) the O/C and OM/OC ratios in Figure 2 are relatively close among different seasons, which is not expected as usual; 2) the mass closure analysis in Figure 3 showed a substantially unidentified fraction, particularly in summer. For example, organic aerosol only accounts for 16% of $\text{PM}_{2.5}$ in summer. Is it due to the low OM/OC ratio? In addition, Canagaratna et al. (2015) recommended a new calibration factor for O/C, which can also increase the OM/OC ratio, and hence the total mass of organic aerosol.

Interpretation of the COA factor need to be cautious. It appears to me that defining this factor as COA is not appropriate although the spectrum has some similarities to the standard spectra of cooking aerosols. One of the reasons is the large contribution of COA in water-soluble organic aerosol (annual average 31.2%), which is much higher than those previously observed in urban cities. Another reason is the extraction efficiency of COA is typically much lower than secondary organic aerosol (Huang et al., 2014).

Check Figure 9. The spectral patterns of ion families and elements should be identical.

Correct “Particular” in the title and abstract.

Some statements need to be clarified. For example, line 33 – 34, higher nitrate than sulfate does not necessarily indicate traffic emissions although I know the authors want to say that traffic emissions are more important than stationary sources. Also, rephrase the statement in line 111 – 114.

Some linear fittings seem not appropriate to force the intercept to be zero, e.g., Figure 6b (winter) and Figure 7b.

References:

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