Atmos. Chem. Phys. Discuss.,
https://doi.org/10.5194/acp-2020-576-RC2, 2020

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Nation wide increase of polycyclic aromatic hydrocarbons in ultrafine particles during winter over China" *by* Qingqing Yu et al.

Anonymous Referee #2

Received and published: 2 August 2020

This work conducted comprehensive field measurements of PAHs in fine particles at 12 sites in China for one year to investigate the chemical compositions, size-distributions, spatiotemporal variations, as well as the public health risk. In addition, diagnostic ratios and PMF model were applied to quantify the contributions from different sources to PAHs in northern China and sourthern China, highlighting the significant impacts from coal combustion and biomass burning, especially in winter in northern China. The manuscript is generally well written with clear logic, fluent language, abundant data, and deep analyses. There are some minor comments and suggestions below which are required to address before being accepted.

Specific comments:

1. Figure 1, keep the longitude and latitude of the map in same scale. If possible, try to use the coordinate of latitude and longitude instead of Cartesian coordinate when drawing the whole map of China.

2. Line 91, delete the extra word "in".

3. Line 134-135 and Figure 8, state the basis of season division. Why four months are included in summer but only two in autumn?

4. Line 149-153, point out the amount of the added internal standards and the specific extraction method.

5. Line 233-235 and 239-241, why most of the PAHs existed in ultrafine particles and the fractions in ultrafine particles varied with seasons? Is this related to the emission sources?

6. Section 3.3, is there any difference in the sources and contributions among urban, sub-urban and rural sites?

7. Line 336-340, the energy consumption data in 2008 from the Statistical Yearbook are not suitable for comparison. The data in 2013 can be used here.

8. Figure 8, it's better to remove the repeated ordinate title of the middle graphs.

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