Atmospheric
Chemistry
and Physics
Discussions

Open Access

ACPD

Interactive
comment

Interactive comment on "Source Apportionment of Fine Aerosol at an Urban Site of Beijing using a Chemical Mass Balance Model" *by* Jingsha Xu et al.

Anonymous Referee #2

Received and published: 1 January 2021

Review of ACP-2020-1020

In the manuscript by Xu et al., the atmospheric fine particle samples from winter and summer at an urban site in Beijing were collected and analyzed. The source apportionment analysis from the Chemical mass balance (CMB) model shows comparable results with that of Positive Matrix Factorization (PMF) analysis of co-located Aerosol Mass Spectrometer (AMS). The paper provides useful scientific evidence to the source contributions in Beijing. However, there are still a few important issues that need to be clarified.

Major issues: One of the major issues in the paper is that the AMS analyzed the

Printer-friendly version

Discussion paper

non-refractory fraction of PM1, but the CMB method was applied to PM2.5 samples. The difference in particle size segments is an important factor that could contribute significantly to the difference between the results from these two source apportionment methods. However, the authors didn't give any discussion about it. Especially, as shown in Figure 8, for the AMS-PMF derived OOA concentrations (in PM1), which generally show slightly higher concentrations than other OC estimated by CMB methods (in PM2.5). The authors have to give some reasonable explanations for this.

P10, line 307-313: It is biased to attribute all deviations to the uncertainty of experimental measurements for heavily polluted periods or the sampling artifacts. Are the reconstructed PM2.5 concentrations absolutely right?

Minor suggestions: Page 3, line63-64:"A better understanding of the sources of PM2.5 in Beijing is essential to provide scientific evidence to control the PM2.5 pollution." Such an expression is inaccurate.

Page 3, the last paragraph: Please pay attention to the logical order of these sentences. For example, you have to introduce the CMB method was used to do the source apportionment first, then state how the source profiles were determined. Similar mistakes were also found in P5, line 143-146.

P5, line 159-160: Please describe exactly how much is "A portion of the filters." So did the other analyses, such as inorganic components using Ion Chromatograph and ICP-MS in Section 2.2.3 (P6, second paragraph).

P7, First paragraph: Please rephrase and reorganized these sentences.

P7, line 241-244: Rewording, please!

P18, line 560-565, and P7 line 245-251: Unnecessary to repeat this.

P19-P20: when describing the comparisons between the results from CMB and AMS-PMF, the language and symbols sometimes are quite confusing; please reorganize them.

Printer-friendly version

Discussion paper