Atmospheric
Chemistry
and Physics
Discussions

Open Access

Interactive comment on "Biomass burning contribution to Beijing aerosol" *by* Y. Cheng et al.

Anonymous Referee #2

Received and published: 10 June 2013

This manuscript by Chen et al. provided the detailed information of biomass burning markers, including levoglucosan, mannonan and water-soluble potassium (K+), over Beijing as well as in source samples. The PMF model and the ratios of these markers were also applied to indicate the contribution of biomass burning. It is also very interesting that the authors tried to identify different types of biomass based on the comparison of the levoglucosan to K+ ratio and the levoglucosan to mannosan ratio. The manuscript merits publication in ACP. My major concern is the PMF model. Firstly, the authors used 7 species as input variables. However, these species are not independent. OC contains WSOC; and oxalate and levoglucsan contributes to OC and WSOC. Since there were 14 species measured in this study, authors are suggested to use independent species as input variables and re-run PMF model. Secondly, the factor explanation is not so robust and reasonable. As authors described, Factor 1 was "secondary nature" and Factor 2 was "not primary". However, levoglucosan and

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

K+ that have high loadings in the two factors are both primary tracers. Are there any secondary sources or processes leading to levoglucosan and K+? Thirdly, as the PMF results showed, BB was the most important contributor to OC ($\sim$50%), which was quite different from other studies in Beijing, such as by Wang (2009) and Zheng (2005). Authors should make a comparison of BB contribution to OC among different studies in Beijing and explain the potential reasons.

Specific comments: Page 15 line 20-22: The authors pointed out that K+ and levoglucosan exhibited an exponential correlation during summer BB episode. However, there are only two points with extreme high values which in fact drive the correlation between levoglucosan and K+. If removing these two points, the correlation should be linear.

Page 18 line 18-23: PMF results showed that BB was not the major source of K+, while levoglucosan was mainly from BB. If so, how to explain the good correlation between levoglucosan and K+? Is it the transport process that resulted in the good correlation?

Page 19 line 25-30: The authors only present the average source contributions for the whole dataset. Since emission sources in Beijing are probably quite different in summer and winter, particularly for biomass burning. The average source contributions during summer and winter are suggested to be separately discussed.

Figure 8: The diagnose plot is interesting and informative. The authors are suggested to plot all BB source samples in this figure. Thus, the readers can easily see the individual region of each BB source and the potential overlap regions.

Interactive comment on Atmos. Chem. Phys. Discuss., 13, 8387, 2013.

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper