

Interactive comment on “Characteristics and sources of carbonaceous aerosols from Shanghai, China” by J.-J. Cao et al.

Anonymous Referee #2

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This study deals with the characterization and the analyses of carbonaceous components in atmospheric aerosols collected for 20 days in Shanghai, China. The collected and analyzed data are comprehensive and could serve as validation data in the future numerical model studies. Although the data analyses and discussion presented before section 3.4 are conventional ones, the source apportionment method presented in section 3.5 is an intriguing way. There is a possibility that this method can be applied to the data collected in other megacities.

Specific comments

1. In the filter sampling of carbonaceous aerosols, especially in the short sampling time of 12 hr, the sampling artifact such as adsorption of organic gases onto the quartz-fiber filter media becomes relatively significant. It is necessary to evaluate the effect of such

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artifact on the measured OC conc., OC thermal profiles, and its effect on the final source apportionment presented in section 3.5.

2. In the thermal analysis of EC, the contribution of carbonate (CaCO_3) sometimes occupies the certain fraction of EC2 or EC3. In this study, did the author remove the carbonate before the EC analysis? This problem becomes important in particular in Megacities in China where unintermittent construction works are going on anywhere. At least, the author can report Ca concentrations in the aerosol samples.

3. The estimated fractions of $\delta^{13}\text{C}_{\text{EC_CC}}$ and $\delta^{13}\text{C}_{\text{EC_MV}}$ to the measured $\delta^{13}\text{C}_{\text{EC_AM}}$ by equation 3 (i.e., X_{CC} and X_{MV} , respectively) may be sensitive to the assigned values of $\delta^{13}\text{C}_{\text{EC_CC}}$ and $\delta^{13}\text{C}_{\text{EC_MV}}$, because the assigned values are not largely different (-23.4 and -27‰). The author should provide the range of X_{CC} and X_{MV} when the assigned value of $\delta^{13}\text{C}_{\text{EC_CC}}$ and $\delta^{13}\text{C}_{\text{EC_MV}}$ varied within their reported error range. In the same manner, there should be some uncertainty range in the OC/EC ratios for CC and MV (2.7 and 1.1) adopted from a literature. The author should evaluate the effect of such uncertainty in the used parameters to the final result of source apportionment calculation.

4. Very low concentration of BaP compared to that of BeP (Table 3) seems strange to the reviewer even the decomposition rate of BaP is faster. Shanghai is one of the largest city in the world and accordingly the load of fossil-fuel originated carbonaceous aerosols may also be one of the heaviest. The author's interpretation, i. e., the potential impacts of non-local or aged aerosol, shall be suitable to the results obtained in the remote environment or at least in the suburbs, but not persuading when applied to the results in Shanghai unless further explanations are given. Can the author provide time-series graph of $\text{BeP}/(\text{BaP}+\text{BeP})$?

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