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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Chemical characteristics of brown carbon in atmospheric particles at a suburban site near Guangzhou, China" *by* Yi Ming Qin et al.

Anonymous Referee #1

Received and published: 24 August 2018

The manuscript by Qin et al. discusses the possible source of brown carbon at Guanzhou, China. The major finding includes 1) biomass burning is the most important source of brown carbon in the region, and 2) importance of nitrogen containing compounds on brown carbon. The topic will attract the interest of the readers of the journal. The manuscript is clearly written, and easy to understand. I suggest publication of the manuscript after addressing the following comments.

P3L6 'BC is major contributor to light absorption that increases the atmospheric energy budget,'

I am not sure what 'increases' means in this context. Is it possible to make the descrip-

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tion to be more specific?

P5 ‘Measurements and data analysis’

I wonder how the relative humidity of the instruments was controlled, especially for the CRD and nephelometer. As water contents influence both extinction and scattering, it is ideal to have clear descriptions on it. In addition, it is ideal to have comprehensive descriptions on how the instruments were calibrated.

P7L126 ‘As shown in Figure 2b, the AAE values, which average at 1.43, are almost always higher than 1,’

The histogram has a variation. It would be interesting to discuss how the temporal variation of AAE was controlled.

P8L154 ‘The diurnal variations of the different wavelengths were not significantly different, although short wavelengths exhibited more obvious diurnal variations. ’

There are some interesting patterns in the diurnal variation. For example, the peak at 1AM is clearer for longer wavelength. The morning peak occurred before 8AM for longer wavelength, while it happens after 8AM for shorter wavelength. It would be ideal to have further detailed descriptions on the pattern of the diurnal variation. P9L186 ‘our results suggest that the absorption coefficient of nascent BBOA’ Would you be able to show evidence to consider it as nascent?

P9L202 ‘light absorption depends on the extent of sp 2 hybridization, in which π electrons are usually found’

I wonder what the ‘extent of sp2 hybridization’ means. Is it the number of sp2 bonding, or length of sp2 conjugated system?

P9L209 ‘CxHyN + and CxH yOzN ++’

Do they predominantly exist in BBOA, or in other types of OA?

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P13L339 ‘Laskin, J., Laskin, A., Nizkorodov, S. A., Roach, P., Eckert, P., Gilles, M. K., Wang, B., Ji, H., Lee, J. and Hu, Q.: Molecular Selectivity of Brown Carbon Chromophores, 2014.’

Journal name is missing.

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