

Interactive comment on “Optical properties and molecular compositions of water-soluble and water-insoluble brown carbon (BrC) aerosols in Northwest China” by Jianjun Li et al.

Anonymous Referee #2

Received and published: 17 February 2020

This paper presents measurements of water soluble and insoluble brown carbon (BrC) in different seasons in Guangzhong Basin in China. The possible sources and radiative effects of BrC are also discussed. The paper is well written and within the scope of ACP. I would recommend the publication of this manuscript in ACP if the comments below are well addressed.

Specific comments:

L148: delete “and”

L171: Can the author give an estimate of the bias of $MAC_{\{\lambda, WI-BrC\}}$ in your measurement. It would be also good to provide measurement uncertainties of other derived

C1

parameters.

L192: Can the author give some details of why 1.3 was used?

L203: how do these numbers compare with the measurement in other polluted regions (e.g. NCP, PRD and YRD) in China?

L219: Since there is a tip at 360 and definitely influences 365, maybe it is better to use another wavelength for reporting abs?

L221: I would not call it “significant higher”

L236: Since your site represents regional background conditions (is it?), how these numbers compare with other regional background measurements?

L311-315: Why is levoglucosan concentration much higher in daytime than in nighttime in summer? $Abs_{\{365, WI-BrC\}}$ shows higher R2 with levoglucosan concentration. Does it mean POA from biomass burning is also an important contributor to BrC in daytime in summer? I think based only on the correlations, it is difficult to judge if primary emission or photochemical formation is more important.

L398: Correlations with RH, sulfate and NO₂ do not necessarily mean that aqueous oxidation has played a role in the formation of WS-BrC. We can see WI-BrC shows the same trend during the period. During haze event, the stagnant meteorological condition with low wind speed promotes the accumulation of BrC no matter how it is produced.

Figure 2e and f not mentioned in the text.

Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2019-1002>, 2019.

C2