

## RESPONSE TO COMMENTS

Title: "Comparison of water-soluble and insoluble organic compositions attributing to different light absorption efficiency between residential coal and biomass burning emissions"

Author(s): Zhang *et al.*,

### Reviewer-1

**Comments:** In this paper, focusing on one major source of BrC, water-soluble (WSOC) and water-insoluble organic carbon (WISOC) from residential solid fuel combustions were characterized by FT-ICR MS, and evaluated for their quantitative relationship with mass absorption efficiency (MAE).

I think the paper is well and clearly written and the experimental and analytical components sound. More minor comments with some requests for clarification on the annotated pdf attached.

**Response:** thank you very much for reviewing and valuable comments to improve the manuscript. We revised the manuscript accordingly. Please refer to the following point-by-point response.

**Comments:** In your paper, the experimental part is methanol-soluble organic carbon (MSOC), but the other parts use WISOC. From the experimental process, this MSOC should be part of WISOC, right? How to express it more clearly?

**Response:** In this study, the term WISOC refers to the OC fraction that is insoluble in water but can be effectively extracted using methanol. To clarify, the sentence on lines 95-97 was revised as *“Due to the inefficiency of water in extracting BrC, the insoluble PM components remaining on the sample filter were freeze-dried and subjected to methanol extraction through sonication. The resulting extract was then filtered using a PTFE filter, yielding a water-insoluble fraction referred to as WIOC in the following text.”*

**Comments:** Line 23-“SOCs” should be defined.

**Response:** noted, the sentence on line 23 was revised as *“.....while sulfur-containing compounds (SOCs) including CHOS and CHONS were more intense in the WIOC extracts.....”*

**Comments:** Line 120-“FT-ICR MS” should be defined.

**Response:** noted, the “2.3 FT-ICR MS Analysis” was revised as *“Molecular composition analysis”*. The sentence on lines 121-122 was revised as *“For further molecular composition analysis, the WSOC and WIOC extracts from seven selected source samples were subjected to Fourier-transform ion cyclotron resonance mass spectrometry (FT-ICR MS) coupled with electrospray ionization (ESI).”*

**Comments:** Line 127-“ESI” should be defined.

**Response:** noted, revised accordingly.

**Comments:** Line 467-“EFs” should be defined.

**Response:** noted, the sentence on lines 260-261 was revised as *“Such dependence was also found in the emission factors (EFs) of NO<sub>x</sub> on fuel nitrogen content in our result.”*

**Comments:** Line 164,171-“WISOC”, “WSOC” (e.g. line 480, 486 , 489, 493, 498, 506 and others). Please pay attention to the font.

**Response:** noted, revised accordingly.