

***Interactive comment on* “Characterization of black carbon-containing fine particles in Beijing during wintertime” by Junfeng Wang et al.**

Anonymous Referee #2

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This manuscript belongs to the results of APHH 2016 winter campaign, it reports measurement results on the chemical properties of black carbon and the coating materials on the black carbon cores. It used a specific Aerodyne soot-particle aerosol mass spectrometry, which allows to analyze exclusively black-carbon containing particles. This technique avoids interferences from other non-BC containing particles, therefore can elucidate more accurately and directly the properties and evolution of BC in ambient air. Such type of measurement was for the first time conducted in wintertime Beijing, the data and results are thus very valuable. I agree its publication in ACP after some minor revisions suggested below: (1) Is there any review paper to introduce this APHH campaign, and how does this paper contribute to the overall goal of this campaign? It should be mentioned. (2) The details of PMF analysis results were not

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mentioned, a diagnostic plot can be provided, at least in the attachment, to justify the choice of PMF solution. (3) Did the authors observe fullerene-related carbon cluster ions in the mass spectra of Beijing BC aerosols? (4) Some modifications on the figures are necessary. For example, Font sizes in Fig 4 appear to be small; mass spectra in Fig.7 are less clear. (5) In Fig.6, the RBC ranges for clean and pollution periods are different, it is better to compare the variations on the same scale? (6) One general suggestion is that this dataset is unique as it measures only BC-particles in a highly polluted environment, the reviewer feels the discussion needs more comparisons with results in other locations or environments. As mentioned by the authors, such measurements were conducted in other sites in US, and Europe, even it is very scarce in China. This can help to show what is special or different or important of the findings observed in Beijing, and what are the implications of such findings to the atmospheric chemistry.

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