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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Characteristics of the main primary source profiles of particulate matter across China: from 1987 to 2017" *by* Xiaohui Bi et al.

Anonymous Referee #1

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(1) The introduction should be improved, to give more description of source profiles and its importance. Also, as a review paper, the developing history and shortages for current source profiles should be better summarized. The science implication should be highlighted. (2) As the introduction of a review articles, all related references should be added. For example, Line 72-75, references for organic compounds, isotope and size distribution should be all listed, not just listing some examples. (3) The word evolution may be not suitable for the review of source profile. I believe change or variation is more suitable. (4) The authors just use the source profile related keywords which may miss some important papers. For example, you could not fine these key words in some tunnel or engine test studies. Also, the Elsevier database is not enough.

Such as papers published on the journals of ACS, AGU, Springer will be missed. (5) In the discussion section, more discussion should be added, not just say the higher or lower of components. Why they are higher or lower? For example, line 210-211 (6) Line 131-132, the sentence indicated dilution sampling has been widely used, but the author just listed one paper. Li et al., 2009 is only for household biofuel burning test. There are many sentences have the same problem. That is, the author just listed one paper to say something. It is not suitable, especially for review articles. Such as Line 142-143, Line 179-183, Line 191-194 (7) In figure 2, change the medium-volume sampling, there are also low-volume sampling methods used in source profile researches. Also in this figure, the sampling methods for vehicle emission should be given. (8) Line 180, what is azzaarenes? It is a component or a type of components? Also the author use "a marker" which is false for plural. Same problem in Line 182. (9) Line 181, the references should be cited by year. The dot "ïijŇ" should be in English "," (10) All the description about VOCs should be deleted in the paper. (11) Line 232-233, why wet desulfurization can cause the conversion of organics to OC? (12) In the discussion part, some sentences are not quantitatively. For example, Line 448-449, the content of volatile components of the firewood is relatively high. The authors should collected the data for volatile materials for different types of fuels and give more reliable results. Line 431-433, "much higher" indicated how much higher? (13) Line 390-391, how can the water-soluble ions contents itself suggests that insoluble matter is the main component? For many soluble components, the previous studies may not analyze them. The authors can only conclude which component are more soluble, but not for particles. (14) Line 381-383, the author say Si is the predominant species, please give the mass percentages of Si in all the elements, not its content level. Similar description in other places. (15) Line 367, Line 365, "generally higher", "relatively small", please give data; (16) Line 363, their proportions were quite different, please give data; (17) Line 351, I think it should be after 2011. Also, for the profiles, how can the authors know the source samples were just collected in 2005, 2008, and so on? Maybe the research published in 2011, but the samples were for older cars than

2008 or even 2005. (18) Line 442, different temperature between FCE and LCS, you mean the burning temperature or the sampling temperature. For the sampling test in LCS, dilution tunnel always reduced the high temperature flume gases to ambient temperature. I guess, it should be the Cl- depletion for ambient field sampling. The English should be improved and there are also obvious errors. I can just list some: (1) Line 79, the sentence should be corrected; (2) Line 304, “is” into “are”

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