

Interactive comment on “Characterization and source apportionment of atmospheric organic and elemental carbon during fall and winter of 2003 in Xi’an, China” by J. J. Cao et al.

Anonymous Referee #1

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General comments: The purpose of this paper is to characterize temporal trends and sources of carbonaceous particulate matters in Xi’an, China. While this is an interesting study, there are several parts revealing lack of the scientific reasoning that should be addressed before the publication. Detailed comments and suggestions are provided below.

Specific comments:

1. The 1st paragraph in page 3563: EC and BC are the analytical definitions, and in some air pollution communities EC and BC are not the same species anymore. Please

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use them appropriately or at least put a sentence to define them clearly.

2. The 2nd paragraph in page 3563: What is the difference between the mineral dust and the dust storm? Generally, dust storm includes mineral particles. Does authors mean the different intensity of their impacts?

3. The 1st paragraph of section 3.1, page 3566: Generally, the separation of heating and non-heating season is used. Please shortly explain how the seasons used in this study (fall and winter) were separated. Average temperature?

4. Table 1: Please do not show the sum of the sample numbers in the 'Average' row.

5. End of the 1st paragraph of section 3.1, page 3566: The OC ratio of the highest to lowest value is higher than those of EC. It does not mean that OC was from several sources. A single point source which frequently shifts its impacts can show highly temporal variability.

6. The 2nd paragraph of section 3.1, page 3566: Please clarify 'these' in 'Pearson ... of these two series'.

7. The 2nd paragraph of section 3.1, page 3566: The high correlation coefficient does not mean that OC or EC was a major contributor. It only means they are highly correlated.

8. The 2nd paragraph in page 3567: 'remove OC and EC' should read 'remove particulate OC and EC'. Please remove 'however' in the 3rd line of the paragraph. Please replace 'normal day' with 'non-precipitation day'.

9. The 2nd paragraph in page 3567: The sentence 'During precipitation, ...seasons at Xi'an' is not persuasive. Please add more explanation.

10. The 2nd paragraph in page 3567: 'Average OC and EC levels in winter ... in winter' does not make sense. The authors cannot explain that the lower OC and EC in fall precipitation time than winter precipitation time was caused by shorter precipitation in

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winter. The OC and EC concentrations in non-precipitation days were also lower in fall.

11. The 1st paragraph of section 3.2: The authors are discussing about the regression coefficients, not correlations. Also, it is not persuasive in relating the number of sources with the regression coefficients or correlations.

12. The 1st paragraph of section 3.3: Please show references for the sentence 'The ratio of OC/EC ...carbonaceous aerosol'.

13. The 3rd paragraph of section 3.3: The sentences 'From Table 2, ... days' and 'Since the precipitation ... to be low' are not connected to the others in the paragraph. The reviewer could not figure out what the Authors were trying to discuss here. Authors need more works/explanations.

14. The 5th paragraph of section 3.3: Please explain in a sentence or two why the measured OC/EC ratios are much different from others, 12.0 vs 2.7 for coal, 60.3 vs 9 for biomass. Again, it is not persuasive that the OC/EC ratio >2 or 8 indicates number of or specific sources.

15. The 3rd paragraph of section 3.4: This paragraph needs more works. Please show the correlation coefficient for the TCA and PM_{2.5}, etc. Please show the supporting materials for the co-variation between TCA % and precipitation events.

16. The 3rd paragraph of section 3.5: This paragraph needs more supporting evidence. For OP, November has the highest % (about 25 %). What does it mean? Figure 5, especially percentile can mislead readers. Please modify Figure 5 appropriately.

17. The 3rd paragraph of section 3.5: 'In contrast, the ... in China'. Please exclude this sentence or add more explanation about the Pearl River study, how this study is related to current study, etc.

18. The 2nd paragraph of section 3.6: October and February are not the low period of EC. In Table 1, PM_{2.5} EC is 13.1 in October, 12.0 in February, and 12.1 in November.

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19. The 3rd paragraph of section 3.6: Please specify which ones are ‘these coastal cities’ for the readers who are not familiar with those cities. ‘The lower difference for EC ... residential heating’ needs more supporting evidence, such as traffic counting, annual coal consumption, etc.

19. Line 23 in page 3573: Please explain ‘case 0’.

20. Line 18 in page 3574: Please show the reference of the gasoline motor vehicle profile. In Figure 5, Coal combustion profile also has similar carbon fractions.

21. Tables 5 and 6: Please use F1, ... instead of PC1,

22. Line 24 in page 3574: Please explain why OP is different between fall (0.13) and winter (0.67) in Biomass burning.

23. Line 16 in page 3575: 48.8 % and 45.9 % do not support that the carbonaceous aerosols are the dominant component of PM2.5.

Interactive comment on Atmos. Chem. Phys. Discuss., 5, 3561, 2005.

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