

Response to the comments from **Anonymous Referee #2**

General comments:

This paper presents aerosol oxalate variation in Shanghai in 2007, and tries to give some information on oxalate formation. But little new insights can be taken from the Abstract. The main idea in this manuscript is the formation pathway of oxalate, however, it is mainly from the correlation analysis between oxalate and K^+ , NO_3^- , SO_4^{2-} . This is apparently not enough as there are no solid evidences and such suggestions have been published in many other papers. Most of the conclusions in the manuscript are from speculations and some seem incorrect. I agree with the other reviewer that deep analyses are needed before the publication.

We'd like to thank for the reviewer's hard work and we have addressed the comments point by point in the followings. Comments on same issues were replied together.

Specific comments:

Abstract, Page 22076, Line 13, why K^+ is an evidence for secondary formation? Isn't it is an evidence for biomass burning as what you said in Line 8? In fact, in the manuscript the secondary formation is from relatively high ratio of oxalate/ K^+ , although this point seems also incorrect. Page 22088, the discussion about "the high oxalate/ K^+ ratio suggested a secondary formation of oxalate formation from biomass burning". I cannot get such information from the discussion. With the only discussion about relatively higher ratio of oxalate/ K^+ ratio in ambient atmosphere than that in biomass plume, such conclusion cannot be reasonably inferred. The higher ratio can also originate from the mixing of biomass burning emissions with other sources. Only when you can prove that there is only one kind of emission in this area (biomass burning), you can made such conclusion. But this is definitely not the truth.

Thank you for the advice. Indeed, higher oxalate/ K^+ ratio in the ambient atmosphere than in the biomass burning plume suggested possibilities of a secondary formation of oxalate from the biomass burning source and/or the existence of other emission sources. In this study, the correlation coefficients of oxalate with sulfate, nitrate and ammonium in autumn were all found to be the lowest among the four seasons (Table 5), which reflected that the contribution from the other sources to oxalate concentration was less important compared to that in the other seasons. Based on these, we came to the inference that biomass burning was an outstanding source of aerosol oxalate in autumn and probably experienced a secondary formation.

Page 22076, Line 21-25. It is not easy to determine that "aerosol oxalate contributed to the haze pollution and visibility" just based on the correlation analysis. Although it shows good correlation between aerosol oxalate and visibility, it is hard to say that oxalate contributes to visibility since oxalate accounts for only very small amount in aerosol mass compared with sulfate and nitrate. In the manuscript it has been suggested that both oxalate and sulfate and nitrate are associated with the secondary formation and they have good correlations. It is also the possibility that sulfate and nitrate contribute to visibility, which influence the correlation between oxalate and visibility. So

this is just from a speculation. Don't say such exactly.

Page 22091, Lines 19-21, I would like to see the correlation coefficient between oxalate with other ions such as sulfate, nitrate. Such information lend itself to the understanding the comparison of relative contribution of oxalate, as well as the ions contribution to the visibility in this city.

The correlation coefficients between oxalate with other ions such as sulfate, nitrate were listed in Table 5. The linear relationship of oxalate with sulfate and nitrate was further discussed in Section 3.2.2. In this paper, oxalate was used as a representative compound of WSOC and/or OC in aerosols, as mentioned times in the manuscript, to indicate the role of aerosol OC in atmospheric visibility reduction and urban air quality. Besides hygroscopic property of the aerosol components, discussion on their optical property was added in the revised manuscript to support the viewpoint from another aspect. Please see Section 3.3 in the revised manuscript.

Page 22093, the first paragraph, you just suggest the contribution of organics in the formation of haze. I cannot see any message as what you state in the Abstract "Aerosol oxalate contributed to the haze pollution and visibility degradation of the local environment." The contribution of organics on haze pollution is not directly equal to the contribution of oxalate to haze pollution.

Yes, thanks for pointing out the mistake in the Abstract. We agree that "The contribution of organics on haze pollution is not directly equal to the contribution of oxalate to haze pollution." which is exactly what this paper tried to elucidate. Aerosol oxalate was used as a representative compound to show the role of aerosol WSOC and/or OC, which took a large fraction of aerosol mass, in the haze pollution. The statement in the Abstract was not accurate. Please see the modified content in the revised manuscript.

I would like to suggest more references in the manuscript when these works are based on other researches. For example, when discussing about the formation of aerosol oxalate, there are lots of sentences, which have been reported by other works and cannot be inferred from your own study. Such sentences should be referenced. Not just limited to this part, as well as other parts.

We think all the referenced literatures had been cited properly in this paper. Please refer to the "Similarity Report" of this manuscript provided by the iThenticate which had been shown to the handling editor before the ACPD publication. The similarities it found are all in the following three kinds of content: (1) signature part of the authors and affiliations as well as the references part; (2) the experimental section. Concerning our research group have been doing the aerosol observation and study over years, lots of research papers applying the similar sampling and analysis methods have been published and cited; and (3) use of common terms and expressions, such as "...can be attributed to...", "...were lower than those in...and...but...", etc.