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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Characteristics, sources and formation of aerosol oxalate in an Eastern Asia megacity and its implication to haze pollution" *by* Y. Jiang et al.

Anonymous Referee #1

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The paper presents the result of oxalate, inorganic ions, and some metal elements of PM2.5 and TSP aerosols collected during one year in Shanghai, China. The authors analyzed the data, focusing on oxalate, in terms of season variations and correlation with some tracers of aerosol sources, and discussed the contribution of water-soluble organic cabon (WSOC) to visibility degradation.

The data set is quite extensive (with a total of 238 sets of samples), and the paper is well written and easy to follow. Unfortunately, the data analysis and interpretation lack depth, as such the paper gives neither new insights in science nor an advance in methodology. Significant revisions are needed to unravel the scientific value of the

data before its publication. My specific comments are listed below.

(1) In the introduction, please state what knowledge gap this paper attempts to fill in. For example, what is new of the present work compared to previous studies in Shanghai and other cities mentioned in the introduction?

(2) The results and discussion section contains a lot of general discussions, but they give few new findings in term of the sources and processes of oxalate. These general discussions can be shortened, and more in-depth analysis of the data should be included. The large part of the discussions replies on simple analysis of correlation of oxalate with other parameters. I suggest the authors consider use a multi-variate analysis such as PMF to examine the relationship of oxalate with other tracers of aerosol sources and meteorological parameters.

(3) The discussion on the contribution of oxalate and WSOC to haze lacks sufficient support from the data collected in the present study. The good correlation of oxalate does not necessarily indicate the importance of WSOC in visibility decrease. To quantify the contribution of each aerosol component to visibility reduction, these components should be individually measured. The mass extinction confident should be considered, so does the hydroscopic property of each component. For example, the IMPROVE program in the US adopts the following formula:

Bext (Mm-1) = 3f(rh)[Sulfate] + 3f(rh)[Nitrate + 4[Organic] + 1[Soil] + 0.6[Coarse Mass] +10[EC] + 10

Where: Bext (Mm-1) is the extinction coefficient,which is proportional to the inverse of virual range; [Sulfate] = (NH4)2SO4; [Nitrate] = NH4NO3,[Organic] = 1.4[OC]; [Soil] = 2.2[Al] + 2.19[Si] + 1.63[Ca]+ 2.42[Fe] + 1.94[Ti]; [Coarse Mass] = [RSP] - [FSP]; f(rh) = hygroscopic species growth function

Alternatively, the authors may apply a multiple linear regression to Bext and the contributing aerosol components.

References

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