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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Elucidating the pollution characteristics of nitrate, sulfate and ammonium in $PM_{2.5}$ in Chengdu, southwest China based on long-term observations" *by* Liuwei Kong et al.

Anonymous Referee #1

Received and published: 19 March 2020

This study provided a good data basis for explaining the pollution characteristics of secondary inorganic aerosols in PM2.5 through a long-term atmospheric observation experiment. The formation mechanism and role of secondary inorganic aerosols during the formation of haze are still a research hot issue. The author not only explained the pollution characteristics of nitrate, sulfate and ammonium in Chengdu, but also analyzed its formation mechanism through observation data and ISORROPIA-II thermodynamic model simulation. Finally, the author also analyzed the distribution characteristics of pollution emissions and potential sources in Chengdu. At present, China is strengthening the control and treatment of air pollution, a long-term atmospheric observation experiment has a high research value for the analysis of the formation of air

pollution and the implementation of haze abatement measures. However, there are some writing, grammatical and technical errors in the paper, and it is suggested that the author carefully revise and organize the presentation of the paper.

Line. 53-54, PM2.5 interpretation is inaccurate. "PM2.5(aerodynamic diameter less than 2.5 μm)"

Line. 58-61, "NSA" is the abbreviation of nitrate, sulfate and ammonium in the paper? please rewrite this sentence.

Line. 77-78, suggest reinterpreting this sentence, how to understand the "regional transport"

Line. 82-83, if the author defines an abbreviation at the beginning of the paper, it is recommended to use the abbreviation below. Please use "NSA" abbreviations instead of nitrates, sulfates and ammonium.

Line. 87, please correct this writing, "(2013-207)"

Line. 106-109, "high time resolution", what's the meaning of this?

Line. 141, in Table 1, parameters not covered in this paper can be removed, such as PM1 and H2S

Line. 185-186, percentile (e.g. 0-25, 25-50, 50-75 and 75-100), please confirm it is consistent with the title of Fig. 13-15 (0-25%, 25-50%, 50-75%, and 75-100%.) in Supplementary materials.

Line. 185-186, it is suggested that the author briefly describe what measures should be taken.

Line. 263, "These variations have similar trends due to meteorological factors", what do you mean?

Line. 306, the legend in Fig. 3 is suggested to be modified, with one reserved, and

also pay attention to modify other pictures, such as Fig.S2 and S8.

Line. 309, replace “daily changes” with “diurnal variation”.

Line. 400, please explain what “r” in Fig. 5 means?

Line. 452, in Fig.7h, “SO42- gas-particle phase partitioning”? inconsistent with the NH4+ in the picture.

Line. 470, please explain what “k” in Fig. 8 means?

In Section 3.5.2, authors are advised to supplement PSCF analysis of NO2 and NO.

Line. 470, modify the Fig.9, remove the repeat “PSCF” in the picture

Line. 521-525, the description is too simple, please rewrite the research results.

Authors are requested to write rules uniformly. It is not recommended to use abbreviations in the title of the figures, such as NSA, AWC, SOR, NOR PSCF. In addition, there are “(a)”, “(b)” and “(c)” in the picture, please explain what it means in the title.

In Fig. 5 and Fig. S4, please confirm the carbon monoxide (CO) unit, “ppb” and “ppm”?

In Supplementary materials, Line. 90 and 96, pay attention to writing, it shouldn’t be “2107”

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