Atmos. Chem. Phys. Discuss.,
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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Aerosol pH and chemical regimes of sulfate formation in aerosol water during winter haze in the North China Plain" *by* Wei Tao et al.

Anonymous Referee #1

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Understanding the relative importance of sulfate formation pathways is essential for mitigation of haze pollution in China. However, there are a lot of debates on this topic. This manuscript presents a very comprehensive examination of aerosol pH and the relative importance of sulfate formation pathways during winter haze in the North China Plain. The results elucidate the dynamic changes in both pH and chemical regimes of sulfate formation. The scientific importance and presentation are of high quality, but some details need to be added before being published. The specific comments are listed below:

Page 4, line 1: in the North China Plain

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Discussion paper

Page 4, line 18: Sulfate is used in other places, use sulfurous instead of sulphurous to keep consistent.

Page 5, lines 5-8: This is heterogeneous uptake of NO2 on surface of fine particles, not aqueous phase chemistry. Is there any reason to include it? The purpose is not clear.

Page 7, lines 14-17: Is there any observation of dissolved FE3+ or MN2+ to adjust FSFE3+ and FSMN2+. In Wang et al. (2016), observations of Fe and Mn are provided. It is not very convincing to adjust FSFE3+ and FSMN2+ based on sulfate observation here.

https://www.pnas.org/content/113/48/13630

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