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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Aerosol acidity in a megacity with high ambient temperature and relative humidity of Central China: temporal variation, determining factors and pollution transition effect" *by* Mingming Zheng et al.

Anonymous Referee #2

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I have to endure to read the manuscript thoroughly because of too many wrong or confusing statements, as pointed by another Reviewer. I only listed a few of them. (1) Line 23, "for different time scales", you have told the resolution is 1-h, the mean values does not mean another scale. (2) Line 25-26, it is difficult for the readers to conclude the seasonal pH values from your monthly results. (3) Line 29-31. I do not know why high RH could lead excess ammonium? What is environmental conditions? (4) Line 36-37, "With atmospheric RH increasing, the aerosol pH exhibited decreasing trend firstly and then increased, with the turning point RH as about 0.48", why? We need

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explanations in the abstract. (5) Line 41, “reduce the aerosol pH” and “further mitigate air pollution”, they are conflicting, as stated in the text. (6) Line 42-43, why the authors insisted Wuhan is a place having unique high RH, what about the coastal cities in southern China? I do not think this statements is enough to support the originality for an ACP paper. (7) Line 53, only “Acidic aerosols have the capability to reduce atmospheric visibility”, the black carbon and organics cannot do so? (8) Line 58, “The aerosol acidity exhibited spatiotemporal discrepancy, owing to the diversities of source emission and meteorological conditions.” I am confused. Which source, which conditions? (9) Line 68, “Even in the same city, the aerosol acidity was different.” It is true? What you mean? (10) Line 71, “One of the key factors for these diversities is that these studies were done at a given period with different pollution levels.” Definitely, it is not correct, the authors should read the papers in detail. (11) Line 72-76, since Liu et al. . .., all of them are nonsense. The authors really do not understand the importance of aerosol pH, and what factors would affect the pH values. I strongly suggest they should read papers in depth. (12) Line 78-79, I disagree “It may limit the understanding of how the aerosol acidity affects the atmospheric chemistry.” Not always is it necessary to measure the ambient air in a whole year for the research. (13) Line 81, “always” is not correct, many studies pointed it is improper. (14) Line 90, “AWC serves as a medium for aqueous phase reaction of SO2 oxidation, which can also lead to the increase of aerosol acidity”. I do not know how to lead to the increase of aerosol acidity. (15) Line 92, it is too simple to explain the relations between AWC and pH. (16) Line 99-101, it is not a scientific question. (17) Line 106, who neutralizes acid? How ammonium neutralizes acid? (18) Line 140, why the results in this MS are urgently for the air pollution formation? Many studies have shown it. (19) Line 183, I do not think “70%” is correct, the high values is not reasonable, please compare the previous studies. (20) Line 189-190, what is the “aqueous phase reactions”? (21) Line 213-214, “.. in summer, ammonium preferred to exist in the form of gas phase due to the thermal equilibrium”, the ammonium could be gaseous?

I cannot point the wrong statements one by one because they appeared in the whole

MS. I strongly suggest the authors check them in detail, and resubmit it for the further consideration.

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