Editor minor revisions request
The authors have successfully addressed the referees' questions and brought relevant contribution into SOA formation processes in North China Plain. For acceptance, I kindly ask the authors to clarify the points below.

1) Referee # 2, question 1: Could the authors, please, add to the manuscript the information that those cations were not measured and justify that statement by using the references from previous studies that were mentioned in the reply?

We thank for the suggestion. The statement and references have both been added in the revised manuscript page 6 line 162-165.

2) Referee # 2, question 8: I think the reviewer has a point in here, which is, in Fig 5, it is possible to see a consistent mass concentration of aq-SOA even when ALWC is very low. Could it mean that those fractions (~10-20%) at low ALWC indicate the presence of a background SOA, not necessarily dependent on the ALWC, or …? I recommend that some brief explanation could be added to the manuscript.

We thank for the suggestion. Actually, this consistent mass concentration of aq-SOA is just because the intervals used. The data were binned according to the ALWC concentration (14 μg m^{-3}, 20 μg m^{-3}, 40 μg m^{-3} increment in P1, P2 and P3), but over 80% of ALWC data were placed in the first interval (ranged from 0 ~ 40 μg m^{-3}) because ALWC showed low mass loading in most period time (Fig.2). That makes the first average aq-SOA concentration was not too low as expected, and it seems like a consistent mass concentration of aq-SOA when ALWC is very low. If we use narrower binned interval we could see the difference. For example, in Fig.S1, we used the narrower binned interval of 5 μg m^{-3} to calculate, the average aq-SOA at the first interval was low enough, and it showed increased trend as the function of ALWC as well. It indicates that aq-SOA are highly dependent on ALWC, and it can still be generated even the ALWC is at low value. Even if there is a background SOA, it will be smaller fraction.

However, we can't replace the Fig. 5 with this narrower bin interval on account of the growth of ALWC is too rapid during the campaign, which will cause the loss of many intervals and calculated results if we use narrower bin intervals.

To be more clear, some explanations have been added to the revised manuscripts page 11 line 343-349 as below.
"Note that there are still consistent mass concentrations of aq-SOA even when ALWC is very low (data interval ranging from 0~40 μg m^{-3}), which is due to that over 80% of ALWC mass concentration were loaded in the first interval, leading to a higher mean value of aq-SOA mass concentration. Actually ALWC showed quite low mass loading in most period time but increased dramatically during P3, yet the time series of aq-SOA and ALWC were remarkably well correlated throughout the entire campaign (R=0.7, Fig. S4) rather than a strong correlation observed only in P3."

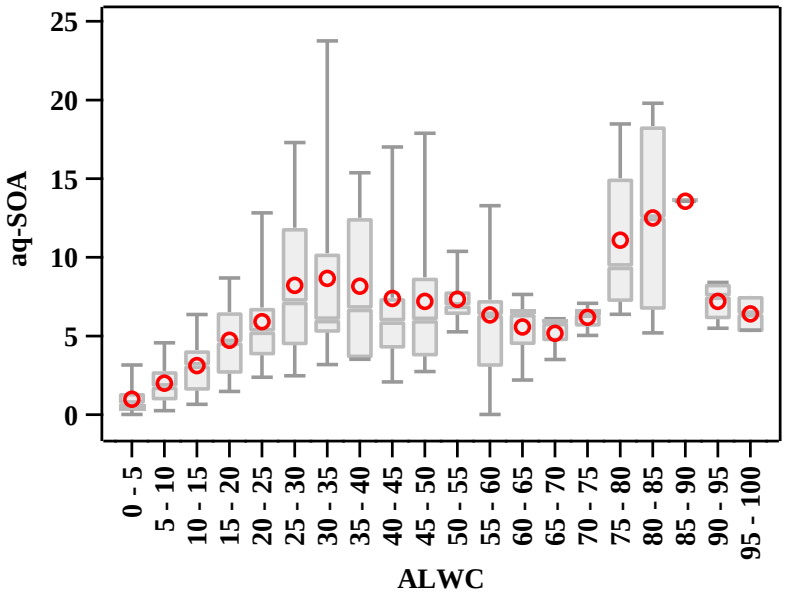

Fig.S1 The mass concentration of aq-SOA (μg m^{-3}) as functions of ALWC (μg m^{-3}) .

3) It is clear that the Ox-initiated-SOA is related to photochemistry, however, could the authors, please, help the reader to properly understand what this terminology actually stands for? For example, if it corresponds to SOA formation initiated due to the presence of Ox, or …?

We thank for the suggestion. More interpretation has been added in the revised manuscript page 7 line 199-205, and now it reads as follows:

"The O_x-initiated-SOA in our study is photochemical production SOA whose formation initiated with the presence of O_x. As O_x has been shown to be a conserved tracer to during photochemical processing (Xu et al., 2017), the relationship between O_x and O_x-initiated-SOA can represent a metric to characterize SOA formation mechanisms associated with ozone production chemistry SOA (Herndon et al., 2008). O_x-initiated-SOA presented an opposite trend with significant increase as function of O_x but decreased as a function of ALWC (Fig. S3), suggesting the dominant role of photochemical processing in the formation of O_x-initiated-SOA."