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Reply on RC2

Hao Luo et al.

Author comment on "Formation kinetics and mechanisms of ozone and secondary organic aerosols from photochemical oxidation of different aromatic hydrocarbons: dependence on NO_x and organic substituents" by Hao Luo et al., Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2021-29-AC2, 2021

Manuscript ID: acp-2021-29

Title: Formation kinetics and mechanism of ozone and secondary organic aerosols from photochemical oxidation of different aromatic hydrocarbons: dependence of NOx and organic substituent

The corresponding author: Prof. Taicheng An

Dear Anonymous Referee #2,

We are sincerely grateful to your attention on this paper. We have made careful modifications and revisions on the original manuscript according to your comments. Below you will find our point-by-point responses to your comments and questions:

Question1: The paper requires some general proofreading for English grammar.

Response: We are very grateful to the reviewer's comment. The whole manuscript was carefully checked and the spelling mistakes were accordingly revised.

Question2: Please add a Table containing initial experimental conditions in Supporting Information in case that the reader can be repeated the procedure as well as the results.

Response: We are very grateful to the reviewer's suggestion. Typical experimental conditions of this study for nine AHs were supplied in the revised supporting information as listed in Table S1. In addition, the corresponding description was given in revised manuscript as 'Typical experimental conditions (e.g., concentrations of AHs and NOx, VOC/NOx ratio, RH and temperature) of this study for nine AHs were supplied in Supporting Information (SI) as Table S1'.

Question3: Line 146: The change of VOC/NOx ratio is the key factor affecting the transformation of AHs to O3. The similarity and difference between this study and previous others' work should be described

Response: We are very grateful to the reviewer's comment. The VOC/NOx ratio ranging from 1.0 to 13.0 was selected to evaluate its effect to O_3 formation. Thus, the corresponding range of VOC/NOx ratio in our work and main references were collected and listed in Table S2 of revised supporting information. The accordingly comparison of our results with these previous data were then conduced in the revised manuscript as 'Meanwhile, the VOC/NOx ratio ranging from 1.0 to 13.0 was selected to its effect to O_3 formation. And the range of VOC/NO_x ratio in above researches was close to that in our study (Table S2). Then, our results of O_3 concentration were comparable to those in the previous studies under similar range of VOC/NO_x ratio'.

Question4: Abstract: Change "NO2" to "NO_2".

Response: We are very grateful to the reviewer's suggestion and the corresponding correction was made.

Question5: Line 48 and 50: "•OH-initiated" should be replaced with "OH-initiated".

Response: We are very grateful to the reviewer's suggestion and the correction was accordingly made.

Question6: Line 100: Change "0 ppb to 16" to "0 to 16 ppb".

Response: We are very grateful to the reviewer's suggestion and corresponding modification has been made.

Question7: Line 132: The reason of choosing 160 ppb NO2 added in the chamber should be given in the manuscript.

Response: We are very grateful to the reviewer's comment. The concentration of NO_2 was selected based on previous works. In these two works, about 100 - 200 ppb of NOx was applied to investigate the photochemical oxidation of AHs. Therefore, the middle value of this region (e.g., 160 ± 10 ppb) was accordingly chosen in this study. Accordingly, the reason was provided in the revised manuscript.