

Please find enclosed two referee reports. While one referee is satisfied with your revision, the second has still some issues that have not adequately addressed and need to be corrected.

I also found, while reading your revised manuscript, several issues that should be considered/corrected before publication:

Response: Thank you for providing the referee reports and for your careful review of our revised manuscript. We appreciate the constructive feedback from both referees and yourself, which will undoubtedly improve the quality of our work. We are pleased to learn that one referee is satisfied with our revision. Regarding the concerns raised by the second referee, we have carefully reviewed their comments and provided detailed responses, along with corresponding revisions in the manuscript. Additionally, we have thoroughly addressed the issues you identified during your review. Below, we provide a point-by-point response to your comments, detailing the changes made to the manuscript. We sincerely hope it now meets the journal's standards for publication. Thank you again for your guidance and consideration. We look forward to your feedback.

General comments:

- P6, L177 and throughout the manuscript: It should rather be PM than P.M. Further a consistent way of writing should be used throughout the manuscript, either "PM" in capital letters or "pm" in small letters.

Response: Thank you for pointing this out. We have carefully revised the manuscript to ensure consistency in the notation. All instances of "P.M." have been replaced with "PM," and the usage of "PM" in capital letters has been applied consistently throughout the text.

- Writing of dates: Omit "th" and "rd" (since it is also not done consequently the same way. Sometimes it is written in superscript and sometimes not). Use complete dates instead, e.g. 4 July 2018.

Response: Thank you for pointing this out. We have revised the manuscript to ensure consistency in the writing of dates. We have removed the "th" and "rd" suffixes and adopted the complete date format (e.g., "4 July 2018") throughout the manuscript.

- Writing of Times: It always should be clear if you refer to local times or UTC, so thus either add UTC or LT depend on the correct time.

Response: Thank you for your valuable feedback. We fully agree that it is important to clearly distinguish between local time (LT) and Coordinated Universal Time (UTC). In the revised manuscript, we have ensured that all time references are clearly indicated as either UTC or LT, depending on the context, to avoid any ambiguity.

P1, L26: Add "model" after MCM?

Response: Added.

P3, L89: Same here?

Response: Added.

P5, L147: "in over" should rather be "in" or "over".

Response: Thank you for pointing this out. We have revised the text by removing "over" and keeping only "in" to ensure clarity and correctness.

P6, L153: add "data" so that it reads "test data set".

Response: Added

P6, L166-167: Avoid separation of "Fig." and the number of the figure, "1".

Response: Thank you for your suggestion. We have revised the text to ensure that "Fig." and the corresponding figure number (e.g., "1") are not separated. This adjustment has been applied throughout the manuscript for consistency.

P9, L225-118: Avoid the double closing or even three times closing parenthesis. Add references without parentheses, thus e.g. "(28.0 ppb, Yang et al., 2020)

Response: Thank you for your helpful comment. We have revised the manuscript to avoid the use of double or triple closing

parentheses. Additionally, we have adjusted the reference format as suggested, using a format such as "(28.0 ppb, Yang et al., 2020)" without extra parentheses.

P10, L250-251: Avoid separation of number and unit at the line break.

Response: Thank you for pointing this out. We have corrected the manuscript to ensure that numbers and units are not separated at line breaks. This has been addressed throughout the manuscript to maintain proper formatting.

P10, L252-253: Also here omit the double parenthesis by removing the parentheses around the reference.

Response: Thank you for your suggestion. We have revised the manuscript to remove the double parentheses around the reference, as recommended.

P10, L257: Has the abbreviation "RIR" been introduced?

Response: Yes, the abbreviation "RIR" is introduced for the first time in the "Abstract" section.

P12, L286: captured its formation rate well in general -> captured its formation rate in general well

Response: Revised.

P13, L304: Overestimate what? Be more clear here.

Response: Thank you for your comment. It refers to the overestimation of PAN concentrations. And we have clarified this point in the manuscript: the OBM model tends to overestimate PAN concentration more significantly.

P13, L312: Remove second parentheses around (Fig. S9).

Response: Removed.

P14 and throughout: Use Copernicus style for units. These should be written without a dot in between.

Response: Thank you for your comment. We have revised the manuscript to follow the Copernicus style for units, ensuring they are written without a dot in between. This adjustment has been applied consistently throughout the manuscript, including in the figures, where the units have also been updated accordingly.

P15, Figure 5 caption: Add days or conditions after haze.

Response: Added.

P16, L378 and 379: local time -> LT

Response: Revised.

P16, L382: Have the abbreviations "OVOCs" and "MGLY" been introduced?

Response: Yes, the abbreviations "OVOCs" and "MGLY" are introduced for the first time in the first paragraph of the "Introduction" section.

P17, L405: Had the abbreviation "RIR" been introduced?

Response: Yes, the abbreviation "RIR" is introduced for the first time in the "Abstract" section.

P18, L438: Remove the x between the numbers (check ACP/Copernicus guidelines. I think they use a dot between).

Response: Thank you for your comment. We have revised the text on P18, L438 to replace the "x" between the numbers with a dot, in accordance with the ACP/Copernicus guidelines. Corresponding changes have also been made consistently throughout the manuscript.

P20, L471: cleaning -> clean

Response: Revised.

P20, L474: ppb/ppb -> ppb ppb-1 (with -1 as superscript)

Response: Revised.

P20, L480: increasing -> increase

Response: Revised.

P21, L501 and 502: nos -> No.

Response: Revised.

Referee report

Some of the critical issues were not addressed properly in this round of revision:

1. The VOCs measurements should be described in more detail, which VOCs could be measured by your instrument is not clear. The authors added a figure on VOCs diurnal variations, however, it is not clear which VOCs were included in each category.

Response: Thank you for your comment. In the revised manuscript, we have added Table R1 in supporting information, which provides detailed information on the VOCs species measured and their respective concentrations. This addition clarifies which VOCs are included in each category. We have added the following sentence in the second paragraph of Section 3.1 (Overview of Observation): "Table S1 provides the detailed VOC concentrations observed during the study period."

Table R1 Measured VOC concentrations during 10-31 July 2018 in Xiamen (units: ppt).

Chemicals	Mean ± SD	Chemicals	Mean ± SD
Aromatics	549±295	Alkanes	5001±1378
ethylbenzene	19±15	ethane	1315±180
o-xylene	21±16	propane	1059±490
m/p-xylene	51±39	isobutane	415±103
isopropylbenzene	4±0	n-butane	599±142
n-propylbenzene	6±1	isopentane	706±198
m-ethyltoluene	12±1	n-pentane	83±74
p-ethyltoluene	8±1	2,2-dimethylbutane	4±5
o-ethyltoluene	7±1	2,3-dimethylbutane	11±19
1,3,5-trimethylbenzene	6±1	2-methylpentane	12±16
1,2,4-trimethylbenzene	62±7	3-methylpentane	29±27
1,2,3-trimethylbenzene	6±1	n-hexane	213±110
benzene	120±59	2-methylhexane	62±12
toluene	183±168	cyclohexane	39±7
styrene	44±10	3-methylhexane	96±19
Halocarbons	166±172	n-heptane	64±14
1,3-dichloropropene	33±33	n-octane	23±4
trichloroethylene	2±6	n-nonane	13±2
trichloroethane	67±88	n-decane	13±2
tetrachloroethylene	4±6	n-undecane	25±5
tetrachloroethane	1±4	Alkenes	747±337
chloroethane	59±129	1-hexene	118±48
OVOCS	699±356	ethene	161±117
acetone	369±166	propene	135±34
butanone	266±158	1,3-butadiene	9±17
4-methyl-2-pentanone	4±2	1-pentene	1±1
methyl tert-butyl ether	60±38	trans-2-pentene	57±12
isoprene	153±53	butene	8±17

2. I still feel it is not adequate to make the correlations between BC and PAN daily maximum concentrations, since they occurred at completely different time of day. This might be just another nonsense correlation without any physical and chemical meaning.

Response: Thank you for your insightful comment. To address your concern, we have recalculated the correlations using daily

average concentrations instead of daily maximum values. The results show that both BC and O₃ exhibit a strong positive correlation with PAN, with correlation coefficients of 0.77. This consistent finding reinforces the close connection between summertime haze and photochemical pollution observed during the study period. Accordingly, we have made the following revisions in the manuscript: in Section 3.1 (Overview of Observation), the second paragraph now reads: "The correlation between the average daily values of PAN and both BC and O₃ is strong, with a correlation coefficient of 0.77 for each (Fig. S6), suggesting that summertime haze and photochemical pollution were deeply connected." Additionally, in the abstract, we have modified it to: "The average daily values of PAN showed a strong correlation with black carbon (BC) (R=0.77) and O₃ (R=0.77), suggesting a close connection between summertime haze and photochemical pollution."

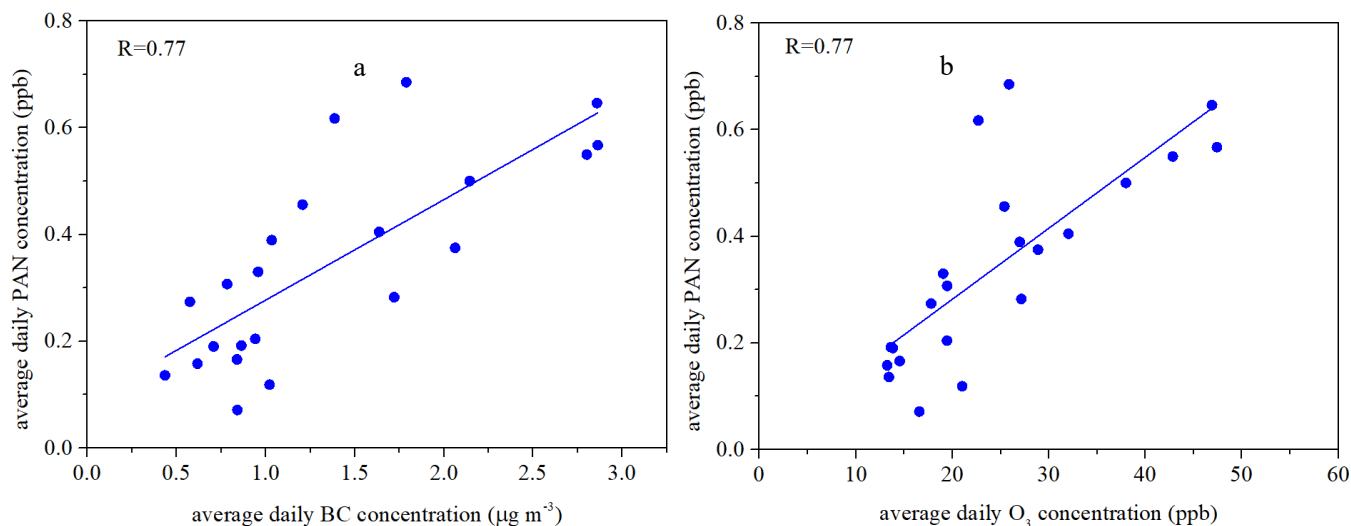


Figure R1. The correlation between the average daily values of PAN and BC (a), as well as the correlation between the maximum daily values of PAN and O₃ (b).

3. The numbers in NO₂, NO₃, SO₄, CH₃CHO etc. in all Figures were not adequately set to subscripts, NO₃ should be clarified to stand for nitrate and not NO₃ radical to avoid confusion.

Response: We appreciate your attention to detail regarding the chemical notations in the figures. We have corrected all instances where subscripts were not properly formatted. Additionally, we have clarified in the figure captions that NO₃⁻ refers to nitrate and not the NO₃ radical to ensure clarity and avoid confusion. As the figures are numerous, the revisions are reflected directly in the manuscript, and we have not included them here for brevity.