Response to Editor

We thank the editor for handling this manuscript and providing constructive comments. We provide herein response and make changes according to the editor's comments.

Public justification (visible to the public if the article is accepted and published):

1. Add response to comment 8 (line 123) into the manuscript.

Response: we have in this version included a brief discussion on the potential effect of temperature change at the end of section 2.2, as follows.

Despite the use of nitrogen as a purge gas to reduce the heat generated by the lamp, temperature variations were still observed within the PAM-OFR. There was a maximum deviation of approximately 13 °C from 25 °C when using SO_2 as the OHR source. However, the $k_{SO2, OH}$ was 8.85×10^{-13} cm^3 $molecule^{-1}$ s^{-1} at 38 °C (Burkholder et al., 2020), which results in the calculated $OH_{exp, dec}$ being only approximately 7% higher than that derived from $k_{SO2, OH}$ at 25 °C. Pan et al. (2023) noted that temperature increases caused by lamp heating exerted minimal influence on gas-phase reaction rates, with SO_2 decay and OH exposure showing negligible variations. Therefore, the influence of temperature on reaction kinetics was not considered in this study.

2. Add response to comment 13 into the manuscript.

Response: we have in this version included the reason why error bars were not included in Figure 1, as follows.

All the error values for $OH_{exp, dec}$ are half or even two orders of magnitude smaller than the corresponding $OH_{exp, dec}$ values. When applying a logarithmic scale, the error bars become difficult to represent. To enhance the readability of the graph, error bars have not been included. For the same reason, error bars for $OH_{exp, est}$ values are also not displayed.