

# ***Interactive comment on “Technical Note: Effect of varying the $\lambda = 185$ and 254 nm photon flux ratio on radical generation in oxidation flow reactors” by Jake P. Rowe et al.***

## **Anonymous Referee #2**

Received and published: 21 September 2020

This paper reports the effect of varying the ratio of UV-light with the wavelength of 185nm versus 254 nm in an oxidation flow reactor. The effects on chemistry is presented and the data is used to parametrize the OH exposure for the set-up. The experiments appear to be sound and done in a thorough way. For a technical note I also fine the interpretations sufficient. One may clarify that the methods generated will most likely only be valid for this specific set-up of the OFR. However, since the aerodyne OFR is commercially available and applied by many groups there is a general interest of the performance.

My major concerns/points to be addressed are:

\*The motivation behind using the estimation equation where six parameters are fitted. I assume the physical meaning behind all these parameters (factors) are described in Li et al but one can expect a short introduction to the equation also in this technical note to understand what are instrumental specifics and what are related to a general parametrization of the chemistry or physics.

\*Clarify to what extent the information provided are limited to the OFRs designed and commercialized by aerodyne. Note: If the extent is significant I would suggest a short statement under “competing interests” according to the ACP policy.

\*The discussion on plug-flow condition. I assume one can give a more accurate description on the residence time distribution with measured data obtained from a pulse of an inert tracer compound.

Minor edits/points:

Row 3: Add NO<sub>3</sub> -radicals

Row 57: I assume this dimming voltage is arbitrary? Can it be described in a better way?

Row 64: Specify the type of quartz.

Row 75/76: Strange wording. For me this would be a “reference OH reactivity” using reactivity of known tracers. Replace “external” with “reference” or “tracer”.

Row 81: See major comment.

Row 96: Strange wording. If I understand right the model was tuned or adjusted?

Row 139: How much of the findings is Hg-lamp specific? Is this deviation to be expected when changing lamps in an OFR?

Row 165: Rephrase so it's clearer that HO<sub>2</sub> and NO<sub>x</sub> in addition to OH increases.

Row 183: Provide the values of used cross-sections.

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Row 202: the used KinSin mechanism is also available in the supplemental?

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