

Atmos. Chem. Phys. Discuss., referee comment RC1
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Comment on acp-2021-895

Anonymous Referee #1

Referee comment on "Optical and chemical properties and oxidative potential of aqueous-phase products from OH and $^3\text{C}^\square$ -initiated photooxidation of eugenol" by Xudong Li et al., Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2021-895-RC1>, 2021

This reviewer enjoyed reading this manuscript, which presents a quite systematic investigation of the aqueous-phase photo-oxidation of eugenol. Indeed, these authors conducted a comprehensive analysis of the degradation kinetics of eugenol, along with the chemical-, optical-properties as well as toxicity (oxidative potential) of the products under direct photolysis, OH- and $^3\text{C}^*$ -initiated oxidation in the bulk aqueous-phase.

The manuscript is well structured and each subsection comes with a thoughtful discussion. I would therefore recommend its publication subject to minor corrections.

One of the key messages here is that the $^3\text{C}^*$ -initiated oxidation dominates over the OH one. This is interesting and in line with other reports. However, it should be nice to state whether this is only valid for the actual laboratory conditions selected here, or if it can be also extrapolated to atmospheric conditions. In other words, how does the ratio of the $^3\text{C}^*$ to OH radical concentrations compare to realistic atmospheric conditions? Can the authors comment on that and therefore justify their choices of concentrations for the oxidant precursors?

The use of acronyms for the selected compounds is justified but it does not ease the reading of the manuscript. It would be nice to state the actual names of the compounds when firstly mentioned in the result section (and not just in the experimental one).

While this manuscript reads well, a final polishing of the English would improve it further (but this is a very minor comment).