

Atmos. Chem. Phys. Discuss., referee comment RC3
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Comment on acp-2021-895

Anonymous Referee #3

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-RC3>, 2022

The manuscript presents an interesting investigation on the aqueous phase photooxidation of eugenol, and its impacts on light-absorption and oxidative potential. However, the entire manuscript is presented as a report, very far from the standard requests of a scientific publication.

- It lacks organization and a logical follow up : instead of clearly providing UV-vis spectra of eugenol and comparing it to the solar actinic fluxes and to their lamp's actinic fluxes to show the potential importance of the photolysis reaction, the authors directly start with a complex comparison between the kinetics of photolysis vs OH-oxidation vs reactivity towards $^3\text{C}^*$, with no appropriate discussion (see below)
- The use of SI is not appropriate: the most interesting figures are provided in SI, and redundant figures are provided in the text with less information (see for example Figure 2 compared to Figure S2)
- The authors provide a systematic and very convincing study of quenching reactions during the photolysis of eugenol, but they forget to discuss on their analytical uncertainties when comparing the influence of the various quenchers. This is particularly critical for the discussions on Fig S4 and S5a
- Too many results are presented with no clear links, and sometimes with no appropriate discussion, but only in reference to other papers, mostly from their own group. For example, the comparison between the kinetics of photolysis vs OH-oxidation vs reactivity towards $^3\text{C}^*$ where no discussion is performed on the amount of OH and $^3\text{C}^*$ precursors, neither the lamp's actinic flux.
- Many small errors can be mentioned. See for example confusion between water solubility and water miscibility, confusion between a radical and triplet state species, ...

There are too many English errors and typos;