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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Heterogeneous ozonation kinetics of 4-phenoxyphenol in presence of photosensitizer" *by* S. Net et al.

Anonymous Referee #2

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This MS describes a photoenhancement of the ozonation of an aromatic compound adsorbed onto a silica surface, due presumably to the presence of a photosensitizer. The enhancement appears real, though modest, and thus represents another nice example of the ideas first promoted by the George group and their collaborators.

I have several questions/issues about the MS as it is currently written, enumerated below.

1. (minor) What is the effect of 4-CB on the dark reaction?

2. (major) How are the rate constants determined? Fig 1 displays I/I0 vs time data which appear linear (and have lines drawn to guide the eye?). But did the authors fit these data to exponential decays? It is neither stated, nor implied. The results in Fig 4

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show k(obs) values, which are the result of the kinetic treatment, so this is important.

3. What do the various symbols shown in Fig 1 represent?

4. (major) page 21654, line 20: Fig 2b does NOT show a linear dependence of phenol growth on time as stated. There is a sharp increase at early times, then a slow rise. This is actually as expected for a 1st order process, in which the reagent is being depleted (or the observed product undergoes further reaction). The authors should discuss this.

5. page 21655: refer to Figure 3. What do the error bars represent in this figure?

6. (major) Sections 3.4-2.6 describe different approaches to the kinetic analysis. They both assume the organic may partition to the gas phase - in the present instance that is (one hopes!) not occurring. Eqn (3) correctly describes the case where the organic is fixed on the surface, and O3 partitions to the surface prior to reaction. I do not see the relevance to including these sections, given that fact. Furthermore, there is no discussion given which relates these sections to the present results.

7. Fig 4 - what do the error bars represent?

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