

Interactive comment on “Daytime tropospheric loss of hexanal and *trans*-2-hexenal: OH kinetics and UV photolysis” by E. Jiménez et al.

E. Jiménez et al.

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General Comments:

The authors really appreciate the referee's comments on our manuscript. All suggestions and comments will be taken into account (and included) in the preparation of the final version of the manuscript. Also, all small changes and issues listed by the referee will be included.

Specific Comments:

a) **Possible LIF emission from aldehydes**

In order to check for the possible detection of the LIF emission from hexanal (by excitation at 282 nm, where the absorption cross section is 5×10^{-20} cm²), a test in the absence of H₂O₂ (and, thus, OH) was carried out. No LIF emission from the aldehyde was observed under our experimental conditions. Thus, it seems to have

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no interference of a possible emission from hexanal. Note that the absorption cross section of OH at the excitation wavelength is known to be several order of magnitudes much larger than those of these aldehydes.

b) **Photolysis of hexanal and trans-2-hexenal**

As we stated in the manuscript our calculated J values are upper limits for both aldehydes. In the case of hexanal, several studies on the photolysis quantum yields (Tadic et al. (2001); Tang and Zhu (2004)) have shown that it is less than unity. Tadic et al. (2001) found that the absolute quantum yield was slightly dependent on total pressure (0.43 at 100 Torr and 0.38 at 700 Torr of synthetic air) and Moorgart (2001) reported an effective quantum yield of 0.28 at atmospheric pressure in an outdoor smog chamber. As suggested by the referee J values in Table 3 will be recalculated taking into account an average quantum yield of 0.28 at all wavelengths and altitudes.

As Referee 3 noted, the simultaneous work on the absolute absorption cross sections of trans-2-hexenal (O'Connor et al., 2006) has already been published in PCCP. Thus, the complete reference will be included in the Reference list and footnote 1, where it was cited as a proceeding of the Gas Kinetics Symposium, will be removed. J values for trans-2-hexenal were calculated in this work as upper limits. However, bearing in mind the results presented by O'Connor et al. (2006), these values are unrealistic, since the photodissociation of the unsaturated compound was not observed. This fact will be discussed in the final version of the manuscript and Figure 5b will be deleted. Plagens et al. did observe the low photolysis rate of trans-2-hexenal as well. J values estimated by Plagens et al. were in excellent agreement with those of O'Connor. They reported a J value for the photolysis of trans-2-hexenal of $2.8 \times 10^{-5} \text{ s}^{-1}$. The cited J2 value in the first version of our manuscript is the one reported by Plagens et al. for the photoisomerisation cis-trans, not for the photodissociation process. That sentence would be re-written to avoid any confusion to the reader.

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