

## ***Interactive comment on “Kinetic study of the gas-phase reaction of atomic chlorine with a series of aldehydes” by D. Rodríguez et al.***

**Anonymous Referee #1**

Received and published: 9 August 2005

Review of ACPD 2005-5-5167, “Kinetic study of the gas-phase reaction of atomic chlorine with a series of aldehydes”, by Rodríguez et al.

General comments:

This paper presents original measurements of the rate coefficient for reaction of Cl atoms with a series of unsaturated and saturated aldehydes. The work appears to be carefully carried out, using multiple reference compounds in both air and N<sub>2</sub> buffer gas. The data are thoroughly discussed in terms of both their atmospheric relevance and structure-reactivity relationships. The work is recommended for publication, subject to minor revisions noted below.

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## Specific comments:

Ranges of concentrations for the aldehydes, reference compounds, Cl-atom source, etc. should be given in the experimental section.

The Thèvenet paper (IJCK, 32, 676, 2000) also gives rate coefficients for reaction of Cl-atoms with smaller unsaturated aldehydes, acrolein ( $\text{CH}_2=\text{CH}-\text{CHO}$ ) and crotonaldehyde ( $\text{CH}_3-\text{CH}=\text{CH}-\text{CHO}$ ). Their values of  $2.2 \times 10^{-10}$  and  $2.6 \times 10^{-10}$   $\text{cm}^3$  molecule $^{-1}$  s $^{-1}$  are higher than the larger members of the series considered in the present work, and thus the trend of increasing reactivity with increasing number of carbons is apparently not followed. Can the authors provide any reason why this might be the case?

## Technical comments:

page 5169, line 9: Should use n-pentanal for consistency with the rest of the paper.

Page 5170, line 6: Should read “no reactant is reformed” rather than “no product is reformed”?

Page 5170, line 12: “experiments” instead of “experiment”.

Page 5170, line 24: “under the experimental conditions” would read better.

Bottom of page 5173: I had a bit of difficulty understanding the logic here at first. Adding the phrase “but was not observed” to the end of the sentence on line 28 would be helpful I think.

Page 5174, line 1: “for the decrease...” would read better than “of the decrease...”

Page 5174, line 20: “the concentrations of other oxidants” would read better than “the rest of radical concentrations”. Also, the phrase “For this reason, the aldehydes...” should be the start of a new sentence.

Page 5175, line 2: “chlorine may originate from” would read better than “chlorine may be originated from”.

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In Table 2, the bottom three ratios given in the last column need to be inverted (alkene rate coefficients are larger than those for the aldehyde).

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Interactive comment on Atmos. Chem. Phys. Discuss., 5, 5167, 2005.

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