Atmos. Chem. Phys. Discuss., 10, C4364–C4367, 2010
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Atmospheric Chemistry and Physics Discussions

Interactive comment on "UV absorption cross sections of nitrous oxide (N_2O) and carbon tetrachloride (CCl_4) between 210 and 350 K and the atmospheric implications" *by* N. Rontu Carlon et al.

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Received and published: 22 June 2010

First, we would like to thank the reviewers for their careful reading and suggestions for improving the overall quality and accuracy of our manuscript as well as for their kind words. We will incorporate the suggested improvements in the revised manuscript as outlined in detail below.

Reviewer #1: Matthew Johnston * What is material of the absorption cell windows? Text on page 11052 (lines 3-4) has been revised to: "Changing the configuration of the

UV grade quartz window mounts was used to change the path length between 90.45 and 55.8 cm."

* I would like a more detailed description of the pressure gauges: Text has been revised and new text added to page 11054 at the end of the experimental details section: "Absolute pressures were measured using calibrated 133 hPa (100 Torr) and 1333 hPa (1000 Torr) capacitance manometers. Two different high pressure gauges were used during the course of this study. Total pressures in the absorption cell ranged from 13.3 to 933 hPa during the course of the measurements. The absolute pressure gauges had a quoted accuracy and linearity of 0.15%. The gauges zero readings were checked under high-vacuum, <10-5 hPa, and at atmospheric pressure, for the 1333 hPa gauge, against a Hg reference manometer. Over a common pressure range the gauges agreed to better than 0.5%, which was consistent with the zero pressure intercepts found in the Beer-Lambert analysis of the N2O and CCl4 absorption data."

* Pressures are given in units of Torr in some places and hPa other places. It would be better to use the same unit throughout – and the SI unit, hPa or mbar. The text has been revised to use units of hPa on pages 11054 and 11062. As given in the revised text in the response above we have also include the Torr equivalent for reference to the commercial gauges.

* Page 11070, line 17, missing second '15' in last NNO isotopomer.: Corrected

* The numbers in Table 1 are small and likely fall under ACPs recommended font size. Agreed. When the table was reduced to fit in the ACPD format the text became too small. We have revised the format for presenting the estimated errors in Tables 1 and 2, both tables were revised for consistency, which reduces the overall width of the tables. The tables will now fit in a two-column format (portrait layout) and should not have to be reduced in size from the legible original.

* Page 11074, Figure 1, the colored region extends from 200 to 230 nm. But if 230 is relevant, then the high energy limit should be extended to ca. 190 nm; fonts of the

ACPD

10, C4364–C4367, 2010

axis labels are too small. For altitudes below 50 km the atmospheric photolysis of N2O and CCl4 below 195 nm is essentially zero, less than at 230 nm which is very small. We have shifted the shaded region in Figure 1 to 195 nm to more accurately reflect a reasonable short wavelength cutoff; we don't want to give the impression that the 190 – 195 nm region is contributing much to the photolysis rate. The font size for the labels has also been increased.

* Figures 2 and 3 – all text is too small. Agreed! We have increased the overall size of the figures and increased the size of the labeling significantly. The overall reduction of the figures to fit in the ACPD layout format compounded the problems with the figure and labeling sizes. There should not be any problem with the clarity of the revised figures especially when they are published in the ACP portrait format, which will not require much, if any, reduction of the overall size (we would like the figures to be full page size in the final published paper).

* Figure 4: Axis label font too small: Labeling font has been increased

Reviewer #2: Anonymous * Larger fonts in Table 1: As described above we have revised the format for tables 1 and 2 such that they are more legible when typeset for publication.

* Enlarge Figures 2 and 3 and text: As described above we have revised the font size of the labels on the figures considerable for improved legibility. The Figures were made slightly larger but they should appear larger in the ACP layout format (portrait). Our intention is that these figures will be full page.

* Reference to Montreal Protocol: The reference given in the text is actually for the WMO 2007 ozone assessment. The reference citation has been revised to include "WMO" for improved clarity.

* Correct Merienne (several places): Done * Correct Hayes: Done * Correct Selwyn and Johnston (1977): Done * Correct Vanlaethem-Meuree et al. (several places): Done

ACPD

10, C4364–C4367, 2010

* Include O(1D) + CCl4 rate constant Text on page 11063 revised to: “This is significantly larger than the loss rate due to reaction with O(1D) (Fig. 6, middle), where the rate coefficient for reactive loss is 2.8 $\times$ 10-10 cm3 molecule-1 s-1 (Sander et al., 2006), which has a maximum of 0.5 – 0.7 ppt/year.”

* Use lower case in reference: I think using capital letters here is correct for a book/report title. We will consult with the ACP production department when the paper is prepared for publication.

* Correct “scenarios”: Done * Correct “Intergovenmental”: Done * Correct “Spectr”: Done * Correct “15NNO”: Done

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Interactive comment on Atmos. Chem. Phys. Discuss., 10, 11047, 2010.