

Interactive comment on “Low temperature mid-infrared cross-sections for peroxyacetyl nitrate (PAN) vapour” by G. Allen et al.

Anonymous Referee #1

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General comments:

The paper by Allen et al. presents the first low temperature mid-infrared cross-sections for PAN. The temperature dependence of the cross-sections is discussed in detail and new insights in the distribution of one of the most important odd-nitrogen compounds might be now possible by remote sensing instruments. Better knowledge of the cross-sections are crucial for the retrieval of PAN by means of new measurements by sensors like MIPAS on ENVISAT and TES on EOS-Aura. The scientific community will highly benefit from these new dataset and ACP is exactly the right place for publications. The paper is well structured and written and it addresses sufficiently all major topics of a good publication. The paper should be published in ACP after some minor revisions

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addressing the specific comments listed below.

Specific Comments:

1) Despite the importance of PAN has been reported in the introduction and a hint on new satellite missions like ENVISAT is given, I am still missing a more detailed discussion about the status of PAN retrievals in the mid-infrared by limb sounders and the caveats one have to cope with. This would allow to bring the new dataset and the quality of the dataset in a better context to the requirements of the scientific community. The last sentence of the 2nd paragraph on page 5671 is not clear to me, what means 'as well as for other compounds having' in the context of appropriate T/p ?

2) Introduction: The term 'super greenhouse gas' related to PAN is not clear to me. Please clarify and/or add a reference.

3) In the experimental method section I miss a comment on the dry nitrogen gas, why you are using it? In later sections you only point to the potentially effects by the nitrogen, which you haven't mentioned before.

4) To my mind the result section should include at least one example of the error-weighted regression. This illustration would help the reader to understand the procedure in more detail.

Technical corrections

1) page 5671, line 26: 'variability in' missing blank

2) page 5675, line 10: 'these samples' the relation is no clear to me, which samples?

3) page 5677, line 24: ' Allen et al, 2005).'

4) line 26/27 : 'to 16% (for the 991 cm⁻¹ band).' include brackets

5) page 5678, line 1: the statement 'overlap between all values' is not clear to me, please clarify.

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