

***Interactive comment on “Comparison of measurements of peroxyacyl nitrates and primary carbonaceous aerosol concentrations in Mexico City determined in 1997 and 2003” by N. A. Marley et al.***

**N. A. Marley et al.**

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Authors Reply to Anonymous Referee Comments:

First we would like to thank the two reviewers for their comments and suggestions. Our response follows:

Anonymous Referee One:

*Is it possible that some of the decrease in PAN levels due to the 2003 study being in April as compared to the February-March 1997 study as PAN levels are temperature dependent?* Authors reply: The temperatures for the two periods were not substan-

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tially different. However, it should be noted that even if it was a bit warmer during the April period - the overall lifetime of PAN is really dependent upon the relative concentrations of NO and NO<sub>2</sub>.<sup>1</sup> Since the PAN levels are formed after most of the NO is converted to NO<sub>2</sub> and the NO<sub>2</sub> concentrations are high relative to NO in Mexico City at that time, the back reaction to reform the PAN is relatively fast leading to no net thermal loss of PAN at elevated temperature. PAN thermal loss is important only when 1) NO<sub>2</sub> levels are low and NO is high (early morning in Mexico City) or 2) in areas where NO and NO<sub>2</sub> are very low and reaction of the peroxyacetyl radical with HO<sub>2</sub> can lead to loss when thermal decomposition occurs. This is the case in the remote troposphere where thermal decomposition of PAN is an important loss mechanism, but is not an important loss mechanism in the polluted environment of Mexico City from noon to late afternoon when NO has been converted to NO<sub>2</sub>.

References: 1. Finlayson-Pitts, B.J. and J.N. Pitts, Jr., Chemistry of the Upper and Lower Atmosphere. Academic Press, San Diego, 2000, p. 219.

*One Correction... is it 10-15 years?* Authors reply: Yes, it should be 10 to 15 years (page 1423 line 9) and we will revise the manuscript to make that correction.

*Paper was well written.* Authors reply: Thanks, we try hard.

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Interactive comment on Atmos. Chem. Phys. Discuss., 7, 1421, 2007.

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