

Interactive comment on “The Comparative Reactivity Method – a new tool to measure total OH reactivity in ambient air” by V. Sinha et al.

Anonymous Referee #2

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Sinha et al. present a promising new technique for the direct measurement of OH reactivity, the Comparative Reactivity Method (CRM). CRM is an in situ chemical kinetics experiment, and the theory and accompanying assumptions are clearly laid out in this paper. This approach has the potential to rapidly improve our understanding of VOCs and oxidation processes in the atmosphere. The paper is very clear and well-written, and includes intriguing measurements of OH reactivity at two sites - most notably, surprisingly high reactivities over the tropical rainforest in Surinam. With minor clarifications outlined below, I recommend this paper for publication in ACP.

OH reactivity is a particularly challenging measurement to make in the atmosphere, and the authors have highlighted several limitations in their approach - namely under high NO_x conditions and in systems with changing humidity. These limitations may

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have to be carefully considered in future field campaigns, but should not hinder this paper's publication. Similarly, while an intercomparison with an LIF-based OH reactivity measurement would be interesting and useful, the authors have used lab studies to demonstrate the validity of the technique, and an intercomparison is not necessary for publication.

Specific Comments:

The uncertainty/error analysis presented (p. 18192, line 3-7) is unclear. Does this analysis include uncertainty in the calibration (ability to produce an accurate and precise amount of OH based on flows, etc)? Do the error bars presented (and the ~20-25% uncertainty referred to in the paper) include the uncertainty introduced by the pyrrole/OH ratio correction factor (line 23, p.18193) and/or the systematic uncertainty introduced by relative humidity effects (Figure 9)?

Technical Corrections:

- Reference required for the first sentence of the Introduction
- P.18182: subscript required for bracket after k
- Fig. 3: Figure caption should explain what the grey bars mean, and what is meant by 'modulation of propane'
- Figure 4,7. The figure caption should explain what the error bars mean (ie, measurement standard deviation or calculated uncertainty including instrument precision, flow rates, etc.?)
- Figure 9. The figure caption should explain what the colours mean (ie, what does the 14.08.05 refer to?)

Interactive comment on Atmos. Chem. Phys. Discuss., 7, 18179, 2007.

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