

# ***Interactive comment on “Impact of uncertainties in inorganic chemical rate constants on tropospheric composition and ozone radiative forcing” by Ben Newsome and Mat Evans***

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Newsome et al. investigate the impact of uncertainties in inorganic chemical rate constants on tropospheric composition and ozone radiative forcing. The study is well-written, very interesting and I recommend publication in ACP after considering several changes as described below.

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## Major issues

My only major concern is that apparently in all sensitivity studies the rate coefficients were *increased* but never *decreased*. Unless a certain reaction is the rate-limiting step inside a reaction cycle, making it faster has only a small effect on the overall rate of the cycle. However, making it slower could make this particular reaction rate-limiting and then the effect becomes large. Why was it never tested what effect a *decrease* of  $k$  by 1  $\sigma$  has?

## Minor issues and technical comments

- Abstract: “Expert panels synthesise laboratory measurements”  
Chemicals are “synthesised” but not laboratory measurements. I think it would be better to say: “Expert panels evaluate laboratory measurements”.
- In the introduction you describe both the JPL and the IUPAC evaluation and then you provide Eq. (1) to describe the uncertainty. It should be noted, however, that IUPAC does not use this definition. Instead, IUPAC defines uncertainties via  $\Delta \log k$  and  $\Delta E/R$ . I think it would be helpful for the reader if you show how to convert between these different ways to express uncertainties.
- In your manuscript you refer to the JPL evaluation from 2011. Have you checked if the uncertainties are still the same in the more recent JPL Evaluation Number 18 from 2015?
- Page 2, line 20: Change “larger uncertainties than quoted here” to “larger uncertainties than quoted here”.
- Page 3, line 2: Change “www.goes-chem.org” to “www.geos-chem.org”.

- Page 7, line 5: Change “NH<sub>4</sub>” to “NH<sub>4</sub><sup>+</sup>”.
- Page 9, line 7: You claim that some “reactions may appear rather un-interesting to some”. What is the reason for this assumption?
- I think it would be better to call the last section “Summary” or “Conclusions” instead of “Discussion”.

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