

## Summary:

I am overall satisfied by the author's responses and changes to the manuscript. Together, the revisions make for a substantially improved manuscript, and do not change the conclusions. To my knowledge, there is no other study like this, and I appreciate the depth to which the authors have addressed the limitations of their study. In particular, new Fig. S9 clearly demonstrates the importance of  $\text{NO}_3$  in the consumption of isoprene in the plume at night, and the error bars in Fig. 5 indicate clearly the variability in the derived yields. This change should be regarded not as skepticism of the yields, but rather a clear statement of the limitations of their measurement, which is not grounds for manuscript rejection.

While, in hindsight, there are some improvements to the experiments I'm sure the authors would like to have made to ensure the organic nitrates being detected in the plume were from isoprene+ $\text{NO}_3$  (described below), this study represents a first approach and should be regarded as foundation for similar studies in the future. One such improvement to the experiment the authors might consider in the future is to use chemical ionization mass spectrometry (CIMS), or another complementary tool to the AMS, for qualitative or quantitative detection of isoprene+ $\text{NO}_3$  oxidation products. Recent studies by Slade et al. (2017) and Lee et al. (2016) highlight this capability for monoterpene- and isoprene-derived organic nitrates.

My only criticism of the current manuscript is that the reported yields need hard uncertainty numbers. Given the error bars shown in Fig. 5, instead of using the standard deviation of the slope coefficient as the uncertainty, the authors should show how the slope varies accounting for the error in  $\Delta$ isoprene and  $\Delta$ pRONO<sub>2</sub>. If you consider the max  $\Delta$ pRONO<sub>2</sub>~100 ppt at  $\Delta$ isoprene ~400 ppt, the upper limit to the yield is ~25%. In contrast, it appears the lower limit of the yield ( $\Delta$ pRONO<sub>2</sub>~20 ppt at  $\Delta$ isoprene~700 ppt) is ~3%. Therefore, a more accurate organic nitrate yield with uncertainty might be 9(+14/-6)%.

## References

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Slade, J. H., de Perre, C., Lee, L., and Shepson, P. B.: Nitrate radical oxidation of  $\gamma$ -terpinene: hydroxy nitrate, total organic nitrate, and secondary organic aerosol yields, *Atmos. Chem. Phys.*, 10.5194/acp-2017-249, 2017.