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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Particulate organic nitrates observed in an oil and natural gas production region during wintertime" *by* L. Lee et al.

Anonymous Referee #1

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The manuscript reports measurements performed during the winter of 2012 in the Uintah Basin showing that (non-biogenic) alkyl nitrates contribute to the mass of fine aerosol. A clear correlation between total aerosol volume for d < 0.5 um and [particulate organic nitrate] supports the previous interpretation of the data. The role of heterogeneous reactions of NO3/N2O5 is presented as a contributor of nitrate groups incorporated into alkane molecules found in secondary organic aerosol. The experimental work included measurements (on a tower) of NO2, total organic nitrates and particulate organic nitrates using TD-LIF. The analysis of sub 2.5 um aerosol from daytime and nighttime filters included TOC, elemental carbon, and ion chromatogra-

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phy of cations. Gas phase measurements were performed using GC-MS, PTR-MS, CRDS, CIMS, and GC-ECD. The work treats the nighttime chemistry after introducing a new parameter (the retaining coefficient) to discriminate the probability of reactive uptake yielding condensed phase organic nitrates. Overall this paper is well written, the analytical treatment appears correct, and the outcome directly impacts the current understanding of particulate organic nitrate production. The final publication of this manuscript in Atmospheric Chemistry and Physics is recommended without revision.

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 10677, 2015.