Atmos. Meas. Tech. Discuss.,
doi:10.5194/amt-2016-23-RC1, 2016

Atmospheric Measurement Techniques Discussions

Interactive comment on "Measurement of isoprene nitrates by GCMS" *by* Graham P. Mills et al.

Anonymous Referee #3

Received and published: 26 May 2016

Summary: Isoprene nitrates (INs) are important components of ambient air particularly in isoprene-rich areas; however, they are difficult to measure and individually identify given the low and variable ambient concentrations of any individual isomer, their chemical reactivities, and high polarities. The authors describe how to synthesize various isoprene nitrates (IN) that are utilized in this study. The majority of the paper focuses on the development of GC-MS methods to fully resolve and positively identify each of 10 IN isomers using different chromatography columns, ionization sources, and calibration methods.

Recommendation: This paper is within the scope of AMT and is a valuable to the larger scientific community. I recommend publications with only minor revisions (see below).

Minor comments:

Abstract: This section should contain more information that what is presented here in

my opinion. It should provide the motivation for the study, a brief description of the method (or aim thereof), and a summary of the most relevant findings.

P1L9 : Add "in the presence of NOx" to describe how isoprene nitrates are formed.

Introduction: The words "recent" and "recently" are overused in the introduction. "Previous" is an alternative term that should be considered.

P1L25: There are an extra set of parentheses around the references

P2L26: Could you briefly elaborate on the "treatment of isoprene nitrates in the difference models"? Are they excluded, lumped, have different reactivities, etc.?

P2L25: It would help the reader if the list of species starting with acetone nitrate (NOA) were in the same order as that presented in Fig. 1 (i.e., (4,3)-IN, . . ., ending in NOA).

P2L27: List the remaining isomers to be more direct and reader friendly.

P3L15: Consider changing this section header to "Identification of Isoprene Nitrates via GC-MS"

P3L16: Consider changing this section sub-header to "Chromatographic Methods"

P4L9: Figure S2.1 is really great. The authors should consider moving S2.1 into the main text in place of Fig. 2. In either figure (S2.1 and/or Fig. 2), it would be very helpful to put the molecular structures from Fig. 1 on each of the respective panels. It makes the mass spectra interpretation discussion (3.2.1 and 3.2.2) much easier to follow.

P5L23: Consider changing this section sub-header to "Sample matrix and photochemistry experiments"

P7L18: What is the volume of the drum used and the approximate concentrations of the analytes within the drum? How does the volume extracted for each sample (and sum of all samples) compare to the initial volume? Wall losses/effects would likely be more pronounced for lower pressure, lower concentration mixtures within a drum.