



Measurement of Isoprene Nitrates by GCMS

Graham Mills (1), Glyn Hiatt-Gipson (2), Sean Bew (2), and Claire Reeves (1)

(1) School of Environmental Sciences, University of East Anglia, Norwich, United Kingdom, (2) School of Chemistry, University of East Anglia, Norwich, United Kingdom

We have, for the first time, synthesised and identified the majority of the primary isoprene nitrates (INs), formed by reaction of isoprene with the hydroxyl radical (OH) and nitrate radical (NO_3) as described in the Master Chemical Mechanism (MCM). An instrument based on gas chromatography/mass spectrometry (GCMS) and the associated calibration methods is described for the speciated measurements of individual isoprene nitrate isomers. Seven of the primary isoprene nitrates formed by reaction of the OH with isoprene in the MCM and three primary isoprene nitrates from the reaction of the NO_3 and isoprene are identified, including six newly synthesised INs. Simple photochemistry bag experiments were performed to demonstrate the capability to measure speciated INs in complex mixtures. Interestingly, the results showed isomeric distributions of INs that were quite different to those predicted by model calculations in earlier studies. In addition, we observed INs that we would expect from NO_3 addition to isoprene despite the bag experiments being carried out in daylight conditions when we would expect OH to be the only isoprene oxidant.