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Supplement of

Alkyl nitrates in the boreal forest: formation via the NO₃-, OH- and O₃-induced oxidation of biogenic volatile organic compounds and ambient lifetimes

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Table S1: Rate coefficients and branching ratios used for the calculations of $P_{\Sigma AN}$

VOC	$k(\text{NO}_3)$ at 298 K (molecules $\text{cm}^{-3} \text{s}^{-1}$)	α^{NO_3}	$k(\text{OH})$ at 298 K (molecules $\text{cm}^{-3} \text{s}^{-1}$)	α^{RO_2}	$k(\text{O}_3)$ at 298 K (molecules $\text{cm}^{-3} \text{s}^{-1}$)	α^{O_3}
α -pinene	6.2×10^{-12} ¹	0.15 ^{2,5}	5.3×10^{-11} ¹	0.18 ⁶	9.6×10^{-17} ¹	0.80 ¹
β -pinene	2.5×10^{-12} ¹	0.40 ^{2,3}	7.6×10^{-11} ¹	0.24 ²	1.9×10^{-17} ¹	0.30 ¹
Δ -carene	9.1×10^{-12} ¹	0.77 ³	8.8×10^{-11} ²	0.23 ²	4.9×10^{-17} ¹	0.86 ¹
<i>d</i> -limonene	1.2×10^{-11} ¹	0.67 ^{2,5}	1.7×10^{-10} ¹	0.23 ²	2.2×10^{-16} ¹	0.75 ¹
isoprene	6.5×10^{-13} ¹	0.70 ¹	1.0×10^{-10} ¹	0.07 ⁴	1.28×10^{-17} ¹	1.00 ¹
unattributed	-	0.70	-	-	-	-

α^{NO_3} : yield of AN in the reaction of the BVOC with NO_3 in air.

α^{RO_2} : yield of AN in the reaction of the peroxy radical (formed in $\text{OH} + \text{BVOC} + \text{O}_2$) with NO .

α^{O_3} is the yield of peroxy radicals formed in the reaction of each BVOC with O_3 in air

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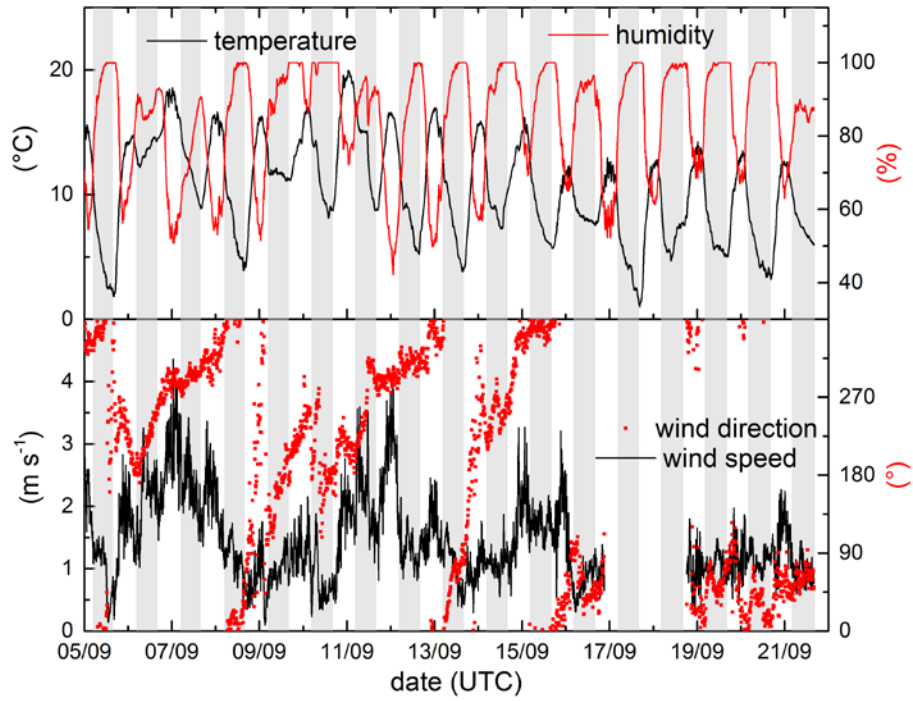


Figure S1: Overview of meteorological measurements during IBAIRN. The grey shaded regions represent nighttime.

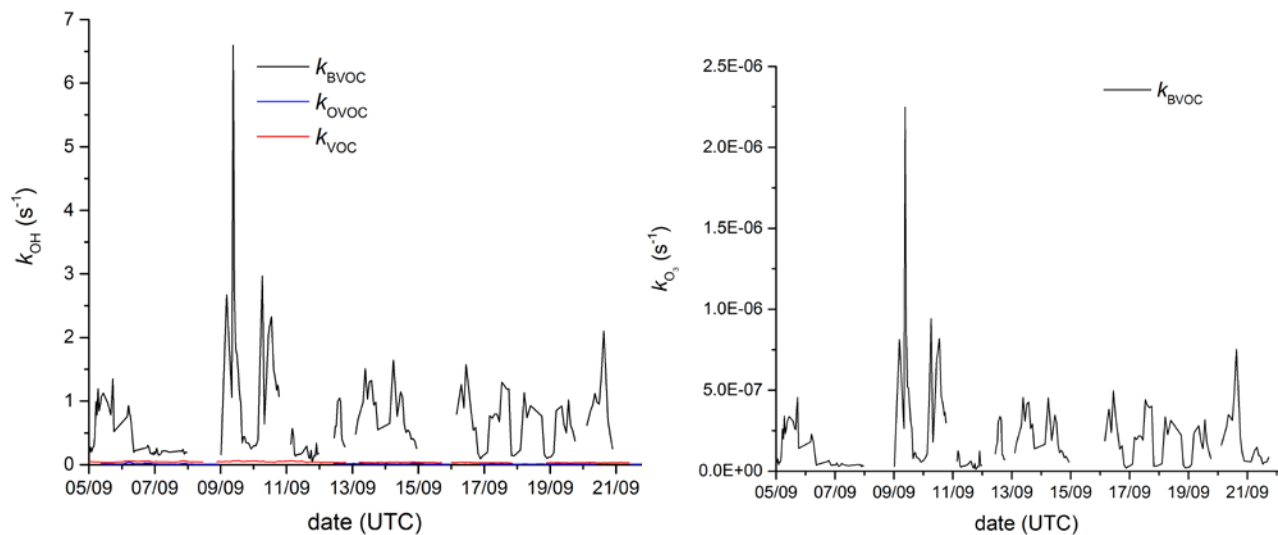


Figure S2: Calculated OH reactivity (k_{OH}) and O_3 reactivity (k_{O_3}) from VOC measurements.

k_{BVOC} (biogenic VOCs) consists of α -pinene, β -pinene, Δ -carene, *d*-Limonene, isoprene, and camphene.

k_{OVOC} (oxidised VOCs) consists of propanoic acid, butanoic acid, isopentanoic acid, pentanoic acid, hexanoic acid, 1-pentanol, 1-penten-3-ol, cis-3-hexen-1-ol, 1-hexanol.

k_{VOC} (remaining VOCs) consists of benzene, toluene, p/m-xylene, styrene, o-xylene, 1,2,4-trimethylbenzene, 1,2,3-trimethylbenzene, hexane, pentanal, hexanal, methacrolein, 4-acetyl-1-methylcyclohexene, nopinone, heptanal, octanal, nonanal, decanal, ethane and propane.

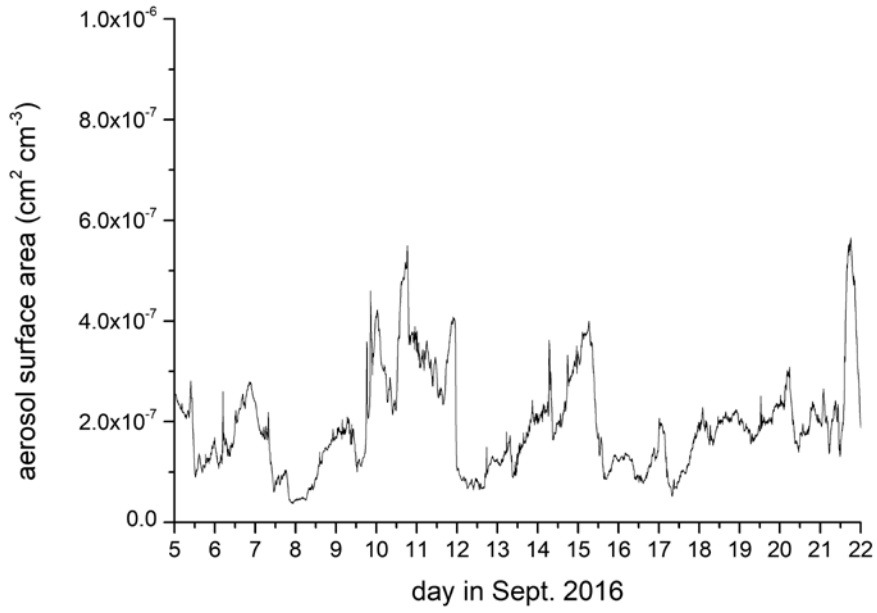


Figure S3: Aerosol surface area during IBAIRN.

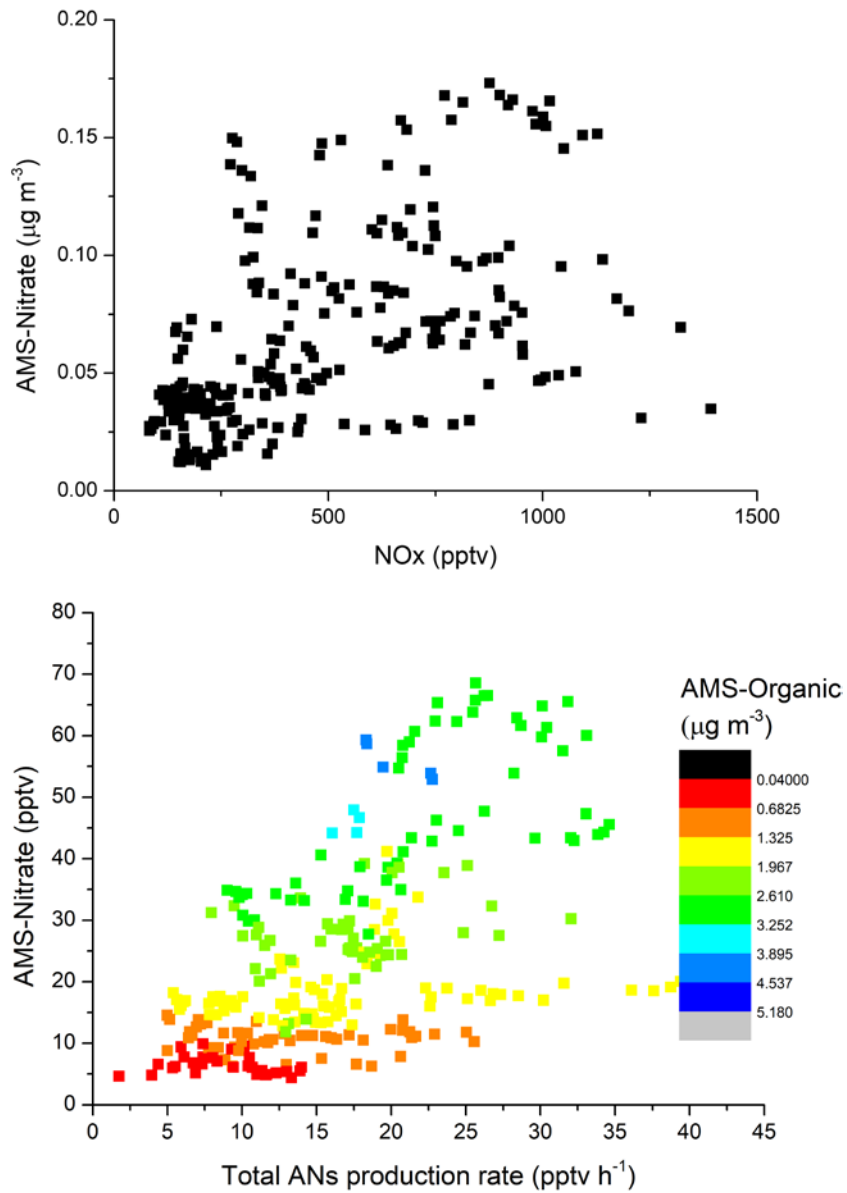


Figure S4: Upper: AMS-nitrate versus NO_x (5th-22nd Sept 2016).
 Lower: AMS-nitrate versus the total ANs production rate colour-coded with AMS-organic mass.

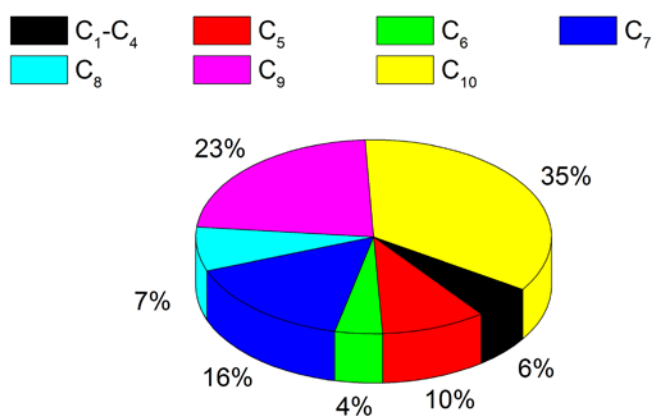


Figure S5: Campaign averaged relative contribution of the measured organic nitrates as measured by the I-CIMS (assuming equal sensitivity across the mass-range).