



Amine Measurements in Boreal Forest Air

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Amines are reactive, volatile bases in the air with a general formula of RNH_2 , R_2NH or R_3N . Especially small amines can stabilize sulphuric acid clusters and hence affect nucleation. Amines react rapidly with hydroxyl radical ($OH\cdot$) thus affecting oxidative capacity of the atmosphere. The amine concentrations are higher in forest air than in urban air (Hellén et al., 2014), but the sources are not known. In order to get more information concerning amine sources, we conducted a measurement campaign in a boreal forest.

At SMEAR II station at Hyytiälä, Southern Finland ($61^{\circ}51'N$, $24^{\circ}17'E$, 180 m a.s.l.) The measurements cover seven months, from June to December 2014. For sampling and measuring we used MARGA (The instrument for Measuring AeRosols and Gases in Ambient air) which is an on-line ion chromatograph (IC) connected to a sampling system. The IC component of the MARGA system was coupled to an electrospray ionization quadrupole mass spectrometer (MS) to improve sensitivity of amine measurements. This new set-up enabled amine concentration measurements in ambient air both in aerosol and gas phases with a time resolution of only 1 hour. With MARGA-MS we analysed 7 different amines: monomethylamine (MMA), dimethylamine (DMA), trimethylamine (TMA), ethylamine (EA), diethylamine (DEA), propylamine (PA) and butylamine (BA).

In preliminary data-analysis we found out, that in June and July most of the measured amines were in gas phase, and particle phase amine concentrations were mostly under detection limits (<1.7 pptv). In June the gaseous amine concentrations were higher than in July. The measured concentrations of gaseous amines followed temperature variation, which could indicate that amines are produced and emitted from the environment or re-emitted from the surfaces as temperature rises after deposition during night-time. All measured amines had similar diurnal variation with maxima during afternoon and minima during night. Results from other months will also be presented.