Observation of OH reactivity in the Tomakomai experimental forest of Hokkaido in summer 2006

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Our group has observed OH reactivity at Tokyo Metropolitan University, which is located at Hachioji, suburban area in Tokyo. OH reactivity is a reaction rate of OH with all compounds in the air, and index of atmospheric OH loss processes. The observed OH reactivity sometimes showed good agreement with calculated OH reactivity, which was calculated with simultaneously measured other compounds, including NOx, O_3, CO, SO_2, and more than 60 VOCs (Volatile Organic Compounds). But other times difference was measured between the two OH reactivities. The difference was due to compounds which were not observed at the observation. Candidates of the compound are biogenic VOCs and oxidized VOCs, secondarily generated in photochemical reactions. But the compound have not exactly assigned yet.

VOCs from biogenic sources have significant effect to atmospheric chemistry in a forest and in an area around forest. We had an observation campaign of OH reactivity from 21 August to 4 September in 2006, at Tomakomai experimental forest of Hokkaido University, which is located at 141^{o}32'45"E ~141^{o}38'36"E and at 42^{o}39'33"N ~42^{o}43'06"N and next to Tomakomai, an industrial city in Hokkaido. The observation system of OH reactivity was developed by our group using laser pump-probe technique, based on LIF (laser induced fluorescence) technique. NO (CL), NO_2 (CL and LIF), CO (NDIR), O_3 (UV absorption), SO_2 (UV fluorescence), 61 VOCs (GC/MS, GC/FID, PTR/MS), and 5 oxidized VOCs (PTR/MS) were measured simultaneously.

Observed OH reactivity was less than 15 s^{-1} during the observation period and lower than those of the measurements in Tokyo. The OH reactivity showed diurnal variation, higher reactivity at daytime and lower reactivity in the evening. Isoprene had large contribution to the OH reactivity during the observation in the forest. The OH reactivity showed good correlations for both temperature and actinic flux.