

OH Radical Reaction Initiated HOM Formation from Biogenic Emissions

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Isoprene (C₅H₈) and the monoterpenes (C₁₀H₁₆) represent the most important non-methane emissions to the Earth's atmosphere. The role of their oxidation products for the process of secondary organic aerosol (SOA) formation is still subject of investigations, despite of the progress in mechanistic understanding of the atmospheric oxidation pathways in the last years.

Recently, the formation of highly oxidized multifunctional organic compounds (HOMs) from the ozonolysis of monoterpenes (α -pinene, limonene, etc.) and their importance to secondary organic aerosol (SOA) formation was conclusively demonstrated. The HOM detection became feasible by the latest developments of on-line mass spectrometric techniques. Here we show experimental results on HOM formation from the OH radical initiated oxidation of α - and β -pinene and isoprene for low-NO_x conditions. The investigations were conducted in two different flow systems at 295 ± 2 K and at atmospheric pressure. HOM detection was carried out by means of CI-APi-TOF (chemical ionization - atmospheric pressure interface - time-of-flight) mass spectrometry (Airmodus, Tofwerk) with a detection limit of $\sim 10^4$ molecules cm⁻³. Highly oxidized RO₂ radicals and closed-shell products were detected as clusters with different reagent ions.