

Measurement of secondary organic aerosol formation by aerosol mass spectrometry during ozonolysis of terpenes.

L. Poulain, H. Herrmann.

Institute for Tropospheric Research, Leipzig Germany.

It is known that gas phase reactivity of terpenes in the troposphere represents an important source of secondary organic aerosols (SOA). However, knowledge about the mechanisms of formation and the variations of the chemical composition of SOA during the time are still relatively sparse.

To study the variation of the chemical composition of secondary organic aerosol during their formation, we followed the SOA production from ozonolysis of three different terpenes (α -pinene, β -pinene and limonene) with an Aerodyne HR-ToF-AMS (High-Resolution Time of Flight Aerosol Mass Spectrometer) to measure their chemical composition in function of particle size. Moreover, the particles size distribution was measured by a DMPS system.

Reactions take place inside a 17m³ aerosol chamber in presence of acidic ammonium sulfate seed particles at 297K with a relative humidity of 37% in free NO_x conditions. Results show a very quick formation of organic compounds in the particle phase just after reactant injection corresponding to SOA formation. Moreover, the organic fragment composition of the SOA changes during experimentation times. Comparison of the different studied compounds shows some similar profiles. This evolution will be discussed