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Gaseous and particulate products from the atmospheric OH-initiated oxidation of g-terpinene and d-limonene

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The formation of secondary organic aerosol (SOA) is one of the research focuses in atmospheric chemical process.

Monoterpenes, which are important constituents of biogenic non methanic organic compound emissions, are the principal natural precursors of SOA. Indeed, their degradation with atmospheric oxidants such as hydroxyl radicals, yields low volatility compounds which readily form secondary organic aerosols.

In this work, we have mainly focused on SOA formation from (OH + monoterpene) reactions. Indeed, (γ-terpinene + OH) and (d-limonene + OH) reactions have been studied at atmospheric pressure, using laser photolysis coupled with UV absorption radical detection. It has been observed in our experimental conditions that particles were formed within a time scale of a few milliseconds after the laser shot generating OH radicals. This could be recorded by observing the scattered light generated by the particles and thus, the formation of particles could be easily monitored in real time.

Resulting oxidation products, which have been formed during these reactions, were trapped in dichloromethane and analyzed by gas chromatography coupled to mass spectrometry. They will be presented and discussed.