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Insights into aerosol formation chemistry from comprehensive gas-phase precursor measurement in the TRAPOZ chamber experiments; an overview

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Aerosols have a profound affect on the environment on local, regional and even global levels, with impacts including adverse health effects, (Alfarra, Paulsen et al. 2006) visibility reduction, cloud formation, direct radiative forcing (Charlson, Schwartz et al. 1992) and an important role in influencing the climate due to their contribution to important atmospheric processes (Baltensperger, Kalberer et al. 2005; Alfarra, Paulsen et al. 2006).

The Total Radical Production from the OZonolysis of alkenes (TRAPOZ) project was used to study the gas phase and radical chemistry along with secondary organic aerosol (SOA) formation for a number of different alkenes and terpenes. In order to better the scientific knowledge regarding the oxidation mechanisms of terpene and alkene species along with radical and SOA formation, the experiments were conducted under varying conditions controlled and monitored by the EUropean PHOto REactor (EUPHORE) simulation chamber in Valencia, Spain.

A vast number of instruments enabled a detailed examination of the chemistry within oxidation of each precursor. However the work here will focus on the results obtained from the University of Leicester Chemical Ionisation Reaction Time-of-Flight Mass Spectrometer (CIR-TOF-MS). With regard to the gas phase chemistry an analysis of the degradation of the precursor Volatile Organic Compounds (VOCs) and evolution of certain gas phase species in each experiment has been presented and discussed.