Contribution of the multigenerational oxidation process to SOA formation and ageing

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Secondary Organic Aerosols (SOA) are formed by condensation of multifunctional species produced during gaseous oxidation of Volatile Organic Compounds (VOC). The Generator for Explicit Chemistry and Kinetics of Organics in the Atmosphere (GECKO-A) has been developed to describe highly detailed gas phase oxidation schemes of organic compounds under general tropospheric conditions[1] and the partitioning of secondary organics between gas and condensed phases[2,3]. This approach leads to the development of chemical schemes involving millions of species and allows the prediction of multiphase mass budgets using first principles. GECKO-A was applied to generate highly detailed oxidation schemes for long chain organic species (C8-C24) and explore SOA formation in a box model. In this study, we examine in detail how the multi generational oxidation process contributes to SOA formation and ageing. Results will be presented showing, generation after generation, the time evolution of the volatility distribution and the oxidation degree of the organic species in the gas and aerosol phases for various hydrocarbons.

References

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