



Temperature dependence of the stable carbon isotope composition of gas- and particle phase components of β -pinene ozonolysis

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The AIDA SOA09 campaign took place from 2-27 November 2009 in the AIDA aerosol and cloud simulation chamber of Forschungszentrum Karlsruhe with the goal to investigate mechanistic aspects of the ozonolysis of α - and β -pinene as well as the partitioning of semivolatile reaction products. Experiments were conducted in the temperature range between 243 K and 303 K at atmospheric pressure utilizing cyclohexane as OH scavenger. During all β -pinene experiments, gas-phase samples were collected in parallel with aerosol samples to subsequently analyze their stable carbon isotope composition. Compound specific carbon isotopic analysis was performed with a GC-IRMS system. From the temporal behaviour of the $\delta^{13}\text{C}$ of β -pinene a kinetic isotope effect (KIE) of 1.00339 was derived, in agreement with literature data at 303 K. Furthermore, the KIE was found to intensify with decreasing temperature. Nopinone, the major oxidation product of β -pinene was found in both the gas- and particle phase. The temperature dependence of the isotopic fractionation of nopinone between the phases will be discussed together with possible applications of the results in atmospheric studies of secondary organic aerosol formation.