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A full mass spectrum evaluation of semivolatile organic compounds measured during the Southern Oxidant and Aerosol Study in Alabama, USA, 2013

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A serial 3-stage denuder system has been developed and for the first time deployed during the Southern Oxidant and Aerosol Study (SOAS) in Centreville, Alabama, USA, for one month during the summer of 2013. Volatile organic compounds (VOCs) were collected on an activated carbon denuder and thermally desorbed to be measured with PTR-MS (PTR-TOF800, Ionicon Analytik GmbH). Comparison with a second PTR-MS instrument operated under standard conditions at the same site revealed poor recovery for the majority of the VOCs while individual species measured by the different PTR-MS systems still exhibited excellent correlation.
Semivolatile organic compounds (SVOCs) in the gas phase were collected and thermally desorbed on a denuder coated with Methylsiloxane (Agilent DB-1). More than 100 SVOCs have been detected at levels in the range 0.05-3 pmmol/mol and only a few species exhibited maximum mixing ratios above 5 pmol/mol. Many of the detected species exhibited a clear diurnal profile while the concentration of some was clearly dominated by pollution events. Carboxylic acids, (oxidized) polycyclic aromatic compounds, and monoterpene oxidation products were compound groups that provided most of the mass and a typical total concentration of the measured burden of SVOCs was 5 microgram per cubic meter.