



## **Presentation of a new technique and first results from terpene oxidation experiments: the Total-Multiphase-Organic-Carbon Mass-Spectrometer (TOMOC-MS)**

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We developed a new technique to measure organic constituents in the gas phase and in aerosols. Based on PTR-MS (proton-transfer-reaction mass-spectrometry) the new instrument can be operated at high temperatures (up to 600 K), and is equipped with special inlets for measuring organics in the gas- and aerosol phase, respectively. The aerosol inlet combines W-CPC (water based condensation particle counter) technology with impactor collection. Controlled temperature ramping evaporates the organics depending on their volatility/vapor pressure thus providing important information for secondary aerosol modeling. The gas phase inlet allows for conventional PTR-MS operation as well as for preconcentration/thermoevaporation of gas phase compounds, permitting detection limits as low as  $\sim 10$  fmol/mol ( $1E-15$  mol/mol). The detection limit for organic constituents in particles is  $\sim 50$  pg/m<sup>3</sup> for a 15 minutes sampling period. The new instrument is designed to provide accurate measurements of physico-chemical parameters that are urgently needed for realistic parameterizations of secondary aerosol formation in climate models - most importantly, gas/aerosol phase partitioning ratios of tracer compounds with different volatilities in typical environments (clean/polluted, warm/cold, humid/dry etc.). Furthermore, the new instrument is a very useful tool to study all aspects of aerosol aging and their associated indirect

climate effects. First measurements demonstrate the strengths of the new concept and yield new insights into the photooxidation and ozonolysis of terpenes.