



Analysis of aerosol filter samples using high mass resolution Proton-Transfer-Reaction Mass-Spectrometry (PTR-MS)

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The recent development of a thermal-desorption proton transfer reaction mass spectrometer (TD-PTRMS) has shown the high potential of PTR-MS for the analysis of the organic fraction of aerosols (www.atmos-chem-phys-discuss.net/9/C9582/2010/). Here we report data from the analysis of aerosol filter samples with a standard high mass resolution PTR-MS. Our lab setup consists of an oven (which accommodates ~ 0.5 square centimeter of the filter sample) the temperature of which can be ramped from ambient temperature to 350 degrees Celsius. The oven is flushed with nitrogen carrier gas which transports evaporating aerosol compounds to the PTR-MS system. We analyzed filter samples from the remote Sonnblick observatory (3108 m), Austria, collected in summer 2008, samples from a field campaign in the city of Ghent, Belgium, in 2004. In each of the two sets of filter samples several hundred compounds have been detected and identified by their molecular formulas. A comparison between the results from urban samples (Ghent) and remote/free troposphere filters (Sonnblick) will be presented. The Sonnblick dataset has been evaluated against the in situ TD-PTRMS data which are available for the same period of time. Possible artifacts of filter sampling and storage are discussed and an overall evaluation of the strengths and limitations of the method will be presented. The analysis of filter samples is straightforward (no derivatization, no pre-treatment) and relatively quick (30 minutes per filter) and therefore this method has the great potential to be applied more commonly than TD-PTRMS – including the analysis of filters from past field studies.