

Carbonyl group containing products from nopinone oxidation

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Biogenic volatile organic compounds (BVOC) such as isoprene, monoterpenes and sesquiterpenes account for a large fraction of the fluxes of atmospheric non-methane hydrocarbons. Their atmospheric degradation leads to multifunctional oxidation products that can contribute to aerosol growth. In particular, semi-volatile carbonyl compounds that are formed during the early stage of the BVOC oxidation play an important role in the formation of subsequent secondary organic aerosol (SOA) compounds. In this study, a series of aerosol chamber experiments were performed to better understand the OH initiated oxidation of nopinone and subsequent oxidation products in both the gas- and particle-phase. Nopinone is a first generation oxidation product of β -pinene and has been rarely studied for its oxidation products (Calogirou *et al.*, 1999).

The gas- and particle-phase products were sampled using a denuder/filter setup. The combination of XAD-4 and 2,4-dinitrophenylhydrazine was applied on the denuder surface to enable in-situ derivatisation of carbonyl compounds. After extraction and sample purification, the derivatised carbonyl compounds were analysed with HPLC/(-)ESI-TOFMS.

The data obtained from the denuder sample analysis were compared to the data obtained from the concurrent PTR-MS measurement. The PTR-MS was used in the scan mode during the OH reactions to detect unknown gaseous oxidation products. The selected ion mode was used for some of the experiments to determine the time evolution of certain compounds.

The off-line denuder sample analysis enabled us to elucidate the structures of unknown compounds whereas the PTR-MS delivers the time series of oxidation products .

The influences of NO_x and seed particle acidity on gas- and particle-phase product distributions will be presented.

References:

A. Calogirou, N.R. Jensen, C.J. Nielsen, D. Kotzias, J. Hjorth, *Environmental Science & Technology* 33 (1999) 453.