



Online Identification of Gas/Particle Products from M-xylene Photo-Oxidation

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Particulate matter in the atmosphere is a major pollutant that contributes to climate change, reduced visibility and negative human health impacts. Secondary particulate matter formed from the photo-oxidation of hydrocarbons significantly contributes to the particulate matter concentration in the atmosphere, particularly in the Northern Hemisphere. However, at this time there is a lack of understanding of the chemical reactions that produce the secondary particulate matter. To further the knowledge in this area, we have been using a newly developed system to investigate the composition of secondary particulate matter formed from the photo-oxidation of aromatic hydrocarbons. The system consists of a flow reactor for hydrocarbon oxidation, an online Counter Flow Membrane Denuder (CFMD) for gas/particle separation and an APCI MS-MS (TAGA 6000E) for composition analysis.

This system has been used to study the HO initiated oxidation of m-xylene. The products formed during the experiment were a complex mixture of organic species in both the gas and particle phase. Results showing the detection of a wide variety of species including ring retaining products, furanones, quinones, and nitrophenols will be presented.