



Quantification of peroxides in secondary organic aerosols by UV-VIS photometry

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Ambient aerosols contain a large fraction of organic material. However, this highly complex organic mixture has only been poorly chemically characterized for individual compounds. Therefore attempts have been undertaken to determine chemical bulk properties such as the amount of specific functional groups. In this work we investigated chamber generated secondary organic aerosols (SOA) for the total amount of the peroxide functional group. SOA was collected on Teflon filters behind a charcoal denuder. The samples were extracted and reacted with KI. Peroxide molecules oxidise iodide to iodine which then forms the yellow coloured triiodide in excess of KI. After 60 min reaction time the absorbance at 425 nm of the whole sample was measured in a 1-cm quartz cell. After 5 hours of photooxidation SOA generated by 1,3,5-trimethylbenzene or alpha-pinene contains 15 to 25 wt% of organic peroxides assuming an average molecular weight of 150 g/mol for the peroxides. Time trends of the peroxides were also determined. The peroxide concentration shows a strong increase until 3-4 hours after start of irradiation and rapidly decreases then to a steady state level at roughly 30- 50% of the maximum.