

## Secondary Organic Aerosol Analysis: Achievements, Challenges and Opportunities

Yoshiteru Iinuma

Leibniz-Institut für Troposphärenforschung (TROPOS), Permoserstr. 15, 04318, Leipzig, Germany  
yoshi@tropos.de

Since Went reported blue hazes over forested areas in 1960, a large amount of research have been conducted to understand the origin and nature of this phenomenon. It is now widely accepted that the blue hazes are caused by secondary organic aerosol (SOA) that forms from the reactions of biogenic volatile organic compounds (BVOC) such as monoterpenes and atmospheric oxidants.

Much effort has been made to characterise chemical species responsible for the formation of secondary organic aerosol. After one of the first chemical characterisation studies used GC/MS with a prior derivatisation to show cis-pinonic acid and cis-norpinonic acid as constituents of  $\alpha$ -pinene originating SOA (Wilson et al., 1972), this technique became a popular tool to elucidate SOA compounds. Since then it has been shown that SOA compounds are highly polar in nature, and techniques that are more suitable for the analysis of polar organic compounds such as LC/MS have largely replaced the GC/MS based techniques, and have provided more information about a wide palette of compound classes that are present in SOA. Nevertheless, only a small fraction of both ambient and laboratory generated SOA is characterised at a molecular level and little is known about the identity of a large fraction of SOA constituents.

This presentation provides an overview about historical development, current state-of-the-art, challenges and future possibilities of SOA characterisation.

Went, F. W., Blue Hazes in the Atmosphere. *Nature* 1960, 187, (4738), 641-643.

Wilson, W. E. Jr., Schwartz, W. E., and Kinzer, G. W., Haze formation – its nature and origin, CRC-APRAC-CAPA-6-68-3, Battelle Columbus Laboratories, Columbus, Ohio, 1972