The contribution of atmospheric aerosols is a large source of uncertainty in our understanding of radiative forcing. Although scattering of light by particles is well known, recent research has shown that particulate absorption can be important in the near-UV (Jacobsen 1998). There have been few studies of the optical properties of secondary organic aerosol (SOA) in the near-UV region. The aim of this study is to characterise the aerosol optical properties of SOA formed from the photolysis of 2-nitrophenol.

Nitrophenols are an important class of aromatic hydrocarbons that are of concern because of their carcinogenic and phytotoxic properties (Harrison et al, 2005). The largest sources of these compounds are anthropogenic and they have been found in air, cloud, soil, fog and snow samples. 2-nitrophenol is a particularly important nitrophenol compound in the troposphere. It is a gas phase precursor of nitrous acid, HONO, and thus an indirect source of the atmospheric oxidant OH.

We have recently developed and demonstrated an incoherent broadband cavity enhanced absorption spectroscopy (IBBCEAS) system for studying the near-UV optical properties of aerosols (Chen et al., 2011; Wilson et al, 2012). The system is connected across a 4 m$^3$ atmospheric simulation chamber in the Centre for Research into Atmospheric Chemistry at University College Cork. Uniquely, the system gives real time, in situ measurements of the aerosol extinction across a continuous spectral region from 320-405 nm.

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References:


