**Chemical Characterisation Of Urban Particulate Matter In The UK**

Air pollution has important harmful effects on the health of the public. A number of pollutants are responsible for these effects but the one with the biggest impact is particulate matter (PM). Unlike a gaseous pollutant, PM is not a simple, single molecular entity, but consists of a huge range of different sizes and shapes containing an equally diverse range of chemical species. The wide variety in suspended PM reflects the wide range of sources into the atmosphere, including from chemical reactions that occur within the atmosphere itself. Although great progress has been made in understanding the sources and effects of PM, there remains considerable uncertainty on a number of issues, including the exact origin of a lot of the carbon-based chemicals.

The aim of this project is to contribute understanding both to the exact nature and origin of some of the carbonaceous fraction of PM, and to those aspects of the PM mix that are most harmful to human health. Current research in the group includes a multi-institution Natural Environment Research Council (NERC) funded project to investigate aspects of organic aerosol composition, including the first UK application of $^{14}C$ measurements to airborne PM to distinguish between OC and EC of fossil and contemporary carbon origin (Szidat *et al.*, 2006). The current PhD project, whist entirely independent of this NERC project, will benefit from, and add value to, this wider research investigation.

Samples of PM will be collected from both roadside and urban background locations, in Edinburgh and Glasgow, using Partisol samplers already available. The carbonaceous material will be extracted from the samples and subjected to multi-stage analyses via techniques used in the study of atmospheric humic-like substances (HULIS), e.g. UV-VIS spectroscopy, IR spectroscopy, NMR spectroscopy, elemental analysis and mass spectrometry (Graber and Rudich, 2006), in order to characterise in a much more detailed manner chemical aspects of this complex component of airborne PM.

**References**

Graber ER & Rudich Y (2006) Atmospheric HULIS: How humic-like are they? A comprehensive and critical review, *Atmos Chem Phys*, *6*, 729-753

Szidat S, Jenk TM, Synal HA, Kalberer M, Wacker L, Hajdas I, Kasper-Giebl A & Baltensperger U (2006) Contributions of fossil fuel, biomass-burning, and biogenic emissions to carbonaceous aerosols in Zurich as traced by C-14, *J Geophys Res-Atmos*, *111*