







# SESEH 2012

## 2012 Sino-European Symposium on Environment and Health

20 – 25 August 2012
National University of Ireland, Galway
Ireland

## Book Of Abstracts

## Conference Programme

## P56

### Transformation of soot particles upon coating of ammonium/triethylaminium sulfate

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Atmospheric aging of soot particles upon coating of ammonium/triethylaminium sulfate through heterogeneous reactions was studied. Soot particles were generated from a laminar flame under controlled burning conditions (methane and air, equivalence ratio Φ = 4.0), which possessed a substantial fraction of low-volatility organic constituents and hence were characterized with a net single scattering albedo (SSA) of 0.46 for 150 nm at 532 nm wavelength. Size-classified soot particles were induced to a sulfuric acid reservoir to acquire the acid coating and then neutralized by ammonia or triethylamine. Upon formation of ammonium/triethylaminium sulfate, variability in morphology, hygroscopicity, and optical properties of soot aerosols was measured using combined techniques of Hygroscopicity Tandem Differential Mobility Analyzer (H-TDMA), Aerosol Particle Mass Analyzer (APM), Cavity Ring-Down Spectrometer (CRDS), and Nephelometer. Soot particles shrunk during the two-step coating and humidification processes. Deliquescence points (DRH) between 70-85% RH were observed for soot-ammonium/triethylaminium sulfate particles. The measured density of ammonium sulfate formed on soot was much less than its theoretical value, indicating a porous and non-crystal structure. Scattering cross section of soot particles remained constant during coating and humidification processes, while absorption cross section decreased upon coating of ammonium/triethylaminium sulfate and increased after elevation of ambient relative humidity.

## P57

### Optical properties of secondary organic aerosol measured using a broadband cavity spectrometer

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Near-ultraviolet optical properties of anthropogenic and biogenic secondary organic aerosol (SOA) are poorly characterised but could significantly influence local atmospheric photochemistry and the earth's radiative balance. This work describes a novel and sensitive spectrometer based on incoherent broadband cavity-enhanced absorption spectroscopy (IBBCEAS) and its application to investigate the optical properties of SOA. The system was used in a simulation chamber to study the early stage photochemical oxidation of isoprene by OH under high $NO_x$ conditions. The aerosol extinction, which was calculated by subtracting the absorption of gas phase absorbers from the total extinction, was strongly correlated with the aerosol particle diameter. This work extends the IBBCEAS technique to the shortest wavelengths yet reported while retaining high sensitivity across a wide spectral window (320 to 450 nm). We evaluate the usefulness of the chamber approach and discuss the potential of the IBBCEAS method for field observations to characterise the radiative properties of aerosols. The approach is most likely to be valuable in megacities with high aerosol loadings, such as Beijing and Shanghai.

## P58

### Phthalate esters in indoor dust matter of Palermo (Italy) area. Extraction, GC-MS analysis

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Indoor air is normally monitored using automatic. Consequently, the costs and difficulty in managing the monitoring of a great number of indoor environments appear immediately relevant. A practical problem in analyzing environmental contaminants is their very low concentration near or below the detectable analytical limits. In air, concentrations widely vary over time. Interpreting trace contaminants concentrations in air and predicting the threat they pose to human life under variable physical-chemical conditions are very difficult.

The purpose of this work is to present a simple method to analyze phthalic esters in indoor dust, used as a passive sampler, because there is a correlation between the persistent allergic symptoms in children and the concentration of phthalic esters in dust collected in the bedrooms. The compounds analyzed in this paper are: dimethyl, diethyl, di-n-butyl, benzyl butyl, bis (2-ethylhexyl) and di-n-octyl phthalate.

Total PAEs concentrations in indoor dusts ranged from 216 to 4589 mg/kg, with an average of 1323 mg/kg. We note differences in phthalate concentrations between buildings from different construction periods; the total concentration of PAEs was higher in ancient houses compared to those constructed later. A linear correlation between total PAEs concentration and age of the building was calculated (r=0.71). The value of r increases if we consider single BBZP (r=0.84) and DEHP (r=0.92).