

**Laboratory and field evaluation of a personal sampler
for engineered nanoparticle exposures**

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Effective assessment of nanoparticle exposures requires accurate characterization of the aerosol. Of increasing concern is personal exposure to engineered nanoparticles that are specifically designed for use in the nanotechnology sector. This presentation will describe the design, operation, and performance of a personal sampler that utilizes thermophoretic force to collect nanoparticles onto a standard TEM (transmission electron microscope) grid. After collection, nanoparticles on the TEM grid are analyzed with an electron microscope, and the resultant data used to determine the characteristics of the nanoparticle aerosol sampled. Further analysis of the collected nanoparticles using energy dispersive spectroscopy allows discriminating engineered nanoparticles that may be of particular concern, from nanoparticles of natural or incidental sources. Thus, the TPS allows evaluation of the potential health risk due to exposure to specific, engineered nanoparticles independently of the potential risk posed by exposure to other aerosol particles that may be present at the same time.

Laboratory experiments were conducted to determine the inlet losses and collection efficiency of the thermophoretic sampler for particles between 20 and 600 nm in diameter. These results are used together with theory for thermophoretic velocity to form a transfer function that relates the properties of the collected particles to the properties of the sampled aerosol. The transfer function utilizes a normalization factor, $F(d)$, which is larger than unity for very small particles but approaches unity for particles larger than about 70 nm. We have also demonstrated TPS performance for sampling and discriminating engineered and non-engineered nanoparticles in the field.

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Dear colleague,

Welcome to the eighth International Symposium on Air Monitoring and Biomonitoring, AIRMON 2014.

Air quality in the workplace and general environment is an important contributor to human health. Numerous air pollutants and mixtures thereof must be monitored and controlled to prevent potential health effects both in workers and the population at large.

The AIRMON symposium was initiated and first organized by occupational and environmental health researchers in the northern European countries in 1993. For more than twenty years it has been a platform for presenting and discussing recent scientific progress in air sampling, exposure assessment, analysis and identification of exposure biomarkers.

This eighth edition of the AIRMON symposium is organized by a consortium of occupational and environmental health institutes in collaboration with a number of universities from Europe and Northern America, for the first time extending beyond northern Europe.

The AIRMON 2014 program provides a comprehensive scientific overview of the current worldwide state of art in air monitoring and biomonitoring through eleven plenary lectures, fifty eight oral presentations and over one hundred poster presentations.

The scientific training tradition of the symposium will continue with six Short Courses on selected topics. During the symposium relevant scientific equipment will be on display and presented by a number of exhibitors.

All presentations (including posters) will be considered for “full paper, peer reviewed publication” in ENVIRONMENTAL SCIENCE: PROCESSES & IMPACTS, which is published in electronic form by the Royal Society of Chemistry, UK.

Last, but not least, an amazing social program has been planned to explore Marseille and the beautiful Mediterranean coast. We hope that you will be captivated by the history and culture of this region of France in addition to the natural beauty of the area. We also hope that meetings with old and new friends will complement our scientific endeavors.

On behalf of the organizers it is our pleasure to welcome you to AIRMON 2014. We wish you an exciting and memorable conference and stay in Marseille.

Symposium co-chairs

Peter Görner and Yngvar Thomassen

