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HEALTH, WORK AND SOCIAL RESPONSIBILITY

*The occupational hygienist and the integration
of environment, health and safety*

BOOK OF ABSTRACTS

Organizers:



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The growing SME and informal sectors rarely, if ever, are able or even willing to utilise occupational hygiene knowledge and skills to address hazards in their workplaces. These include dealing with common problems such as noise, dust, hazardous chemicals and biohazards.

This poster will provide some practical examples of how the international hygiene community could provide wider access in the developing world to this critical preventive workplace tool. It proposes a model based on the IOHA-supported International Occupational Hygiene Training Modules to develop local capabilities and deliver occupational hygiene services to small and informal business sectors. Focus will be on some countries in the south Asian region and in sub-Saharan Africa with limited occupational hygiene resources.

T22 - NANOTECHNOLOGIES, NANOMATERIALS AND ULTRAFINE PARTICLES

[ABSTRACT ID: 281]

NANOPARTICLES EXPOSURE IN THE WORK ENVIRONMENT AS A HEALTH RISK. THE PROBLEMS OF OCCUPATIONAL EXPOSURE EVALUATION

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Nanotechnology is currently one of the most popular branch of science. It is a technology, which enable designing, manufacturing and application of materials and structures with very small dimensions including this one with nanometer size. The nanotechnology products are applied in almost every field of life. Nanoparticles are the structures having one or more dimensions of the order of 100 nm or less. They are used in precise mechanics, electronics, optics medicine, pharmacy, cosmetics and many other spheres. Due to its very small size, nanostructures have completely different and specific properties, unknown for the bulk materials. Fast-growing nanotechnology gives the width spectrum of application, but also it brings new, unknown danger for human health.

Nanotechnology is the branch, which developed relatively recently, and more of information about health risk and influence for environment is out of our knowledge. Nanoparticles, released in many technological processes as well as manufactured nanoparticles can determine occupational hazards for workers. Manufactured nanoparticles may be inhaled unintentionally during production at the workplace. Epidemiological study have shown that exposure to airborne nanoparticles is correlated with adverse health effects, particularly increased pulmonary and cardiovascular responses.

Fundamental problem concerning the exposure evaluation is the shortage of regulations and standards, obliging during manufacturing and using of nanoparticles. The other problem is the choice of proper measurement equipment, for surveying of very small particles – they number, mass and surface area, in the workplace air.

The aim of this communication is to discuss and present opportunity and range of exposure assessment and the specification of available instrumentation for counting and assessing the parameters for nanoparticles exposure qualification. Current research indicate that nanoparticles mass may be less important than the number and particularly surface area nanostructured materials. Nanoparticles contributed less than 1% total dust mass, but nearly 90% particles number. It was shown that surface area is the metric that is highly correlated with particle-induced adverse health effects. The exposure assessment includes determination the number of nanoparticles (using condensation particle counter), their mass (aerosol monitor) and the surface area (nanoparticle aerosol monitor).

The answer to the question which of parameter of nanoparticles exposure (number, mass or surface area) has significant influence to health effects occurrence is one of the major scientific problem and requires further studies.

[ABSTRACT ID: 340]

NANOIMPACTNET – SCIENTIFIC COOPERATION AND DIALOGUE BETWEEN RESEARCHERS AND STAKEHOLDERS IN THE HEALTH AND ENVIRONMENTAL IMPACT OF NANOMATERIALS

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NanoImpactNet (NIN) (1) is the European network on the health and environmental impact of nanomaterials. It is, first and foremost, a multidisciplinary exchange platform for research ideas. NIN shares its outputs with stakeholders from industry, professional associations, government, civil society and trade unions across Europe. To improve this communication, we identified the stakeholders' interests and needs. Starting in 2008, a series of workshops discussed the state of the art of nano-research, identifying knowledge gaps in the fields of nanomaterial characterisation and the behaviour of nanomaterials in the environment for use in life cycle assessments. Other workshops concentrated on the need for common strategies to allow comparisons of protocols, and the difficulties in getting access to potentially sensitive industrial data. All stakeholder groups agreed on the necessity for a lot more scientific data to be generated and shared, notably on: potential toxic and safety hazards of nanomaterials throughout their lifecycles; fate and persistence of nanoparticles in humans, animals and the environment; and risks associated with nanoparticle exposure, for which researchers are in the front line. Also highlighted was the urgent need for: nomenclature, standards, methodologies, protocols and benchmarks; development of best practice guidelines; voluntary schemes on responsibility; and databases of materials, research topics and themes. Findings show that NIN researchers and other stakeholders share very similar knowledge needs, and that open communication and free movement of knowledge will benefit all parties. We encourage all stakeholders in the health and environmental impacts of expanding nano-industries to be active members of NIN, to ensure safe and responsible development, production, use and disposal of nanomaterials. Funding: NanoImpactNet is a Coordination Action funded by the European Commission's 7th Framework Programme (GA218539).

(1) NanoImpactNet: 24 partner institutes and >300 associated members, www.nanoimpactnet.eu

[ABSTRACT ID: 580]

THE MORBIDITY OF NANOTECHNOLOGY INDUSTRY WORKERS

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OBJECTIVES

Although nanotechnology has many advantages, it can be accompanied with potential risks caused by nanomaterials.

Majority of current literature examining harmful effects of nanoparticles has been focusing on cell or animal experiments, while epidemiological studies are still lacking. The aim of this study was to establish a cohort of nanotechnology industrial workers in order to investigate health hazards associated with their occupation.

METHODS

This cohort of nanotechnology industrial workers was recruited from a company list of a project conducted by the Institute of Occupational Safety and Health in 2006 in Taiwan - 'Evaluating the Occupational Health Risks of Nanotechnology'. Using information obtained from questionnaires and interviews, the workers were classified into exposed-group and control group. Medical claim data from the National Health Insurance (NHI) and Bureau of Labor Insurance (BLI) was extracted for these two groups and then used for comparison of health hazards between the two groups.

RESULTS