OCCUPATIONAL EXPOSURE TO NANOPARTICLES IN THE CERAMIC INDUSTRY

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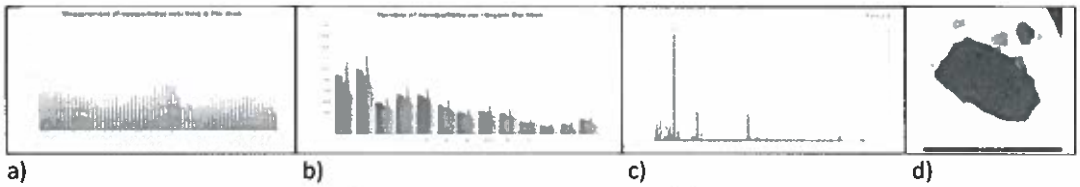
Some studies on occupational exposure to particulates have pointed out to dangerous effects for workers about inhalable and respirable particles. These scenarios of occupational exposure are extremely complex, since they involve components inherent to individuals, working conditions and the activity itself [1]. Regarding the ceramic industry, workers may be exposed to nanomaterials throughout the production process because of their unintentional release [2]. Taking into account these considerations we have been conducting a study evaluating the professional exposure to nanoparticles in several jobs in different plants of the Portuguese ceramic industry, within European Project CERASAFE (SIINN/0002/2014). This study aims to characterize and evaluate the occupational exposure of workers to nanoparticles in different types of ceramic industries, namely identify exposure scenarios in the workplace and characterize the exposure for the manufacture of ceramic nanomaterials; identify relevant nanomaterials and assess their toxicity and contribute to increase knowledge about the health effects of exposure of workers to nanoparticles in the ceramics industry. To perform the toxicological evaluation in this industry nanoparticles were monitored using the Nanoparticle Surface Area Monitor (NSAM) and the NanoScan Scanning Mobility Particle Sizer Spectrometer (SMPS) and the capture of nanoparticles in copper grids took place with the Nanometer Aerosol Sampler (NAS) for further analysis by Transmission Electron Microscope (TEM), in order to observe the morphology of the nanoparticles and Energy Dispersion X-Ray Spectrometry (EDS), to determine their elemental chemical composition, as shown in the figures presented below.



a) b) c) d)

Figures a) to d): Monitoring results and TEM/EDS micrographs: a) nanoparticles vs time; b) number of particles vs size range; c) composition by EDS; d) nanoparticles by TEM

[1] A. Sousa-Uva, Diagnosis and Risk Management in Occupational Health. Lisbon, *Institute for Safety, Hygiene and Health at Work* (2006).

[2] D. Hristozov, I. Malsch, *Sustainability*, **1**:1161-1194 (2009).