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Occupational exposure to nanoparticles in differentiated ceramic production processes

Abstract

Some studies on occupational exposure to particulate matter have pointed to dangerous effects for workers as regards inhalable and respirable particles. These occupational exposure scenarios are extremely complex, as they involve components inherent to individuals, working conditions and the activity developed (Sousa-Uva, 2006). In what concerns the ceramic industry, workers may be exposed to nanomaterials during the whole process of production due to its involuntary release (Hristozov and Malsch, 2009). Taking these considerations into account, measurement campaigns were carried out in Portuguese ceramic industries, producing different products, in order to characterize and evaluate the occupational exposure of workers to nanoparticles in order to be able to understand:

- the existence of different measured values in the ceramic units;
- the typology of nanoparticles emitted;
- pulmonary accumulation from different manufacturing processes.

To perform the evaluations, a Nanoparticle Surface Monitor, TSI, Model 3550 was used which measured the superficial area of nanoparticles deposited in the lung expressed as $\mu\text{m}^2/\text{cm}^3$, and also a NanoScan SMPS Nanoparticle Sizer, TSI, Model 3910 which measured the size distribution as well as its concentration in real-time workplaces.

References

- [1] Hristozov, D., Malsch, I., Sustainability, 1, 1161-1194 (2009).
- [2] Sousa-Uva, A. - Diagnóstico e Gestão do Risco em Saúde Ocupacional. Lisboa, Instituto para a Segurança, Higiene e Saúde no Trabalho, 2006.

Figures

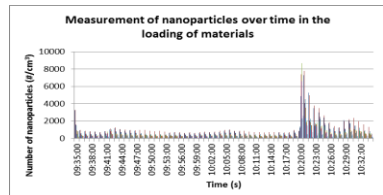


Figure 1: Measurement of nanoparticles in a refractory brick company

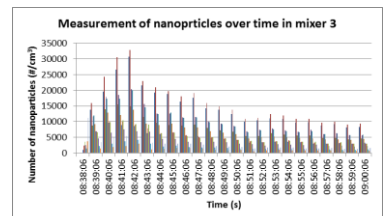


Figure 2: Measurement of nanoparticles in a sanitary ware company