

Towards Methodologies to Assess Occupational Exposure to Engineered Nanomaterials

Supporting/Contributing Agencies: NIOSH, U.S. EPA, NSF

In 2009, Professor Peters together with Drs. Grassian and O'Shaughnessy reported on the classification of airborne nanomaterials apart from background aerosols in a production facility that makes lithium titanate nanomaterial for use in rechargeable batteries (Peters et al. 2009). They used single-particle analysis with electron microscopy to characterize airborne particles collected on filters with conventional IH sampling.

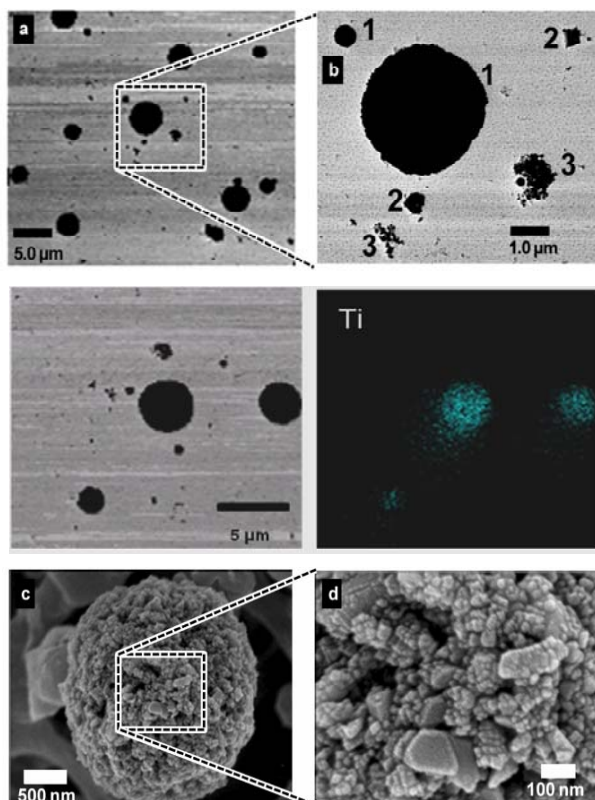


Figure. *Caption.*

The results unequivocally demonstrate that airborne nanomaterials can be larger than nano-sized particles but still have nanostructure that might make them workplace hazards. They also demonstrate that nanoparticles may be background aerosols unrelated to manufacturing. This type of detailed information is essential for the design of toxicity tests that are environmentally relevant and is necessary to select appropriate strategies for routine monitoring, controlling exposures, and establishing appropriate OELs.

This work is the first to classify airborne particles by type (engineered or background) and size in a nanomaterial manufacturing facility. It shifts the way one would approach protecting workers from inhalation to nanomaterials.

Reference/Publication

Peters, T. M., S. Elzey, R. Johnson, H. Park, V. H. Grassian, T. Maher and P. O'Shaughnessy (2009) Airborne monitoring to distinguish engineered nanomaterials from incidental particles for environmental health and safety, *J. Occupational and Environmental Hygiene* 6(2): 73-81.