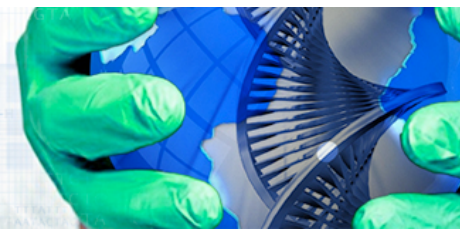


The OHS concerns of nanomaterials



What are nanomaterials?

Nanomaterials are objects with one or more dimensions, or surface structures, on the nano-scale. The nano-scale ranges from approximately 1-100 nanometres - with one nanometre being one billionth of a metre.

Nanomaterials are being used in a host of sectors and products, including medicine, cosmetics, food, clothing, agriculture, diverse consumer products, aviation and energy.

Health concerns

There is a growing body of peer-reviewed research indicating potentially serious health concerns with some nanomaterials.

Nanomaterials are generally more chemically reactive than larger particles of the same chemicals and potentially more toxic. They are also much more likely to be taken up into our cells and tissues.¹ Numerous studies have shown nanoparticles can be absorbed through the skin, lungs and intestine and often accumulate in the liver, kidney, spleen, lung and brain.²

Nanoparticles have been associated with immune dysfunction and colon cancer and there is evidence that nanoparticles may remain in the body for extended periods.³ These studies, while not focused on workplace exposure, are of particular OHS concern because of the levels and frequency of exposure of many workers to nanomaterials with little or no regulatory protection.

In many cases, a lack of data makes an assessment of the safety of products containing nanomaterials impossible, yet only a handful of nanomaterials are subject to any regulation at all.

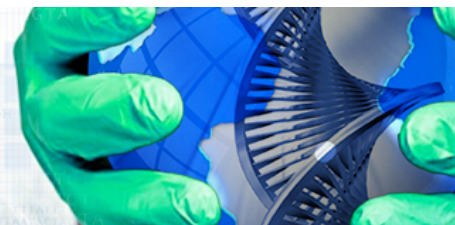
Some nanomaterials have asbestos like properties

Carbon nanotubes are used in a range of applications including sports equipment, electrical equipment, solar cells, water filters and textiles. They have asbestos like qualities and have been categorised as a hazardous chemical by Safe Work Australia.⁴ Although the agency has published guidelines⁵ for the safe handling of carbon nanotubes, there is no enforcement of these practices. Furthermore, a review of 50 Material Safety Data Sheets (MSDS) by the agency found that 84% of the MSDS “did not provide adequate and accurate information sufficient to inform an occupational risk assessment for nanomaterial contained in the product”. 11 out of 12 MSDS relating to carbon nanotubes described their risk as equivalent to that of graphite.⁶ The absence of labelling and a mandatory nanomaterial register means that many workers are likely to be handling nanomaterials without their knowledge.

Nanomaterials exhibit new properties and should be assessed as new chemicals

In 2004 the United Kingdom’s Royal Society recommended that given the evidence of serious nanotoxicity risks, nanomaterials should be treated as new chemicals and subject to new safety assessments before being allowed in consumer products. It also recommended that releases of nanomaterials to the environment should be avoided as far as possible until it could be demonstrated that the benefits outweighed the risks.⁷

The OHS concerns of nanomaterials



In Australia the overwhelming majority of nanomaterials remain effectively unregulated. While our national chemicals regulator NICNAS (the National Industrial Chemicals Notification and Assessment Scheme) has introduced regulation for nano forms of new chemicals, nano forms of existing chemicals still remain unregulated. Although many nanomaterials now in commercial use pose greater toxicity risks than the same materials in larger particle form, if a substance has been approved in bulk form, it remains legal to sell it in nano form. There is no requirement for new safety testing; product labelling or new occupational exposure standards or mitigation measures to protect workers or to ensure environmental safety.

A mandatory nanomaterial register is needed

The US National Research Council argues that “inventories are needed that describe what ENMs [Engineered Nanomaterials] are being produced, how they are being used, and what their forms are along the value chain.”⁸ France has adopted a nanomaterial register, Belgium and Denmark intend to, and the European Commission is currently assessing the feasibility of EU nanomaterial register. Calls for an Australian register have been made by the ACTU and the Australian Nano Business Forum.

A national nanomaterial register is urgently required to enable accurate supply chain tracking of nanomaterials and enable effective risk identification and management.

What needs to happen?

Friends of the Earth is calling for:

1. A mandatory register of nanomaterials to allow the tracking of nanomaterials through the supply chain and risk assessments to be conducted;
2. A moratorium on the commercial release of products containing nanomaterials until testing has determined that they are safe;
3. The labelling of all products containing nanomaterials to allow consumer choice.

¹ Friends of the Earth (2014) Way too Little: Our Government’s failure to regulate nanomaterials in food and agriculture, http://emergingtech.foe.org.au/wp-content/uploads/2014/05/FOE_nanotech_food_report_low_res1.pdf

² *Ibid.*

³ Buzea *et al.* (2007) Nanomaterials and nanoparticles: Sources and toxicity, *Biointerphases*, **2(4)**:MR17 - MR172, available at: <http://arxiv.org/ftp/arxiv/papers/0801/0801.3280.pdf>; Elsaesser, A. & Howard, C.V. (2012) Toxicology of nanoparticles, *Advanced Drug Delivery Reviews* **64**:129–137 C

⁴ Safe Work Australia (2012) Information sheet - Classification of Carbon Nanotubes as Hazardous Chemicals, http://www.safeworkaustralia.gov.au/sites/swa/about/publications/Documents/726/Classification_of_Carbon_Nanotubes_as_Hazardous_Chemicals.pdf

⁵ Safe Work Australia (2012) Safe handling and use of carbon nanotubes, <http://www.safeworkaustralia.gov.au/sites/SWA/about/Publications/Documents/664/Safe%20Handling%20and%20Use%20of%20Carbon%20Nanotubes.pdf>

⁶ Safe Work Australia (2010) An Evaluation of MSDS and Labels associated with the Use of Engineered Nanomaterials, http://www.safeworkaustralia.gov.au/sites/swa/about/publications/Documents/374/AnEvaluationofMSDSandLabelsassociatedwiththeuseofengineerednanomaterials_June_2010.pdf

⁷ UK Royal Society/Royal Academy of Engineers (2004) *Nanoscience and nanotechnologies: opportunities and uncertainties*, London.

⁸ NRC (2013) Research Progress on Environmental, Health, and Safety Aspects of Engineered Nanomaterials, <http://dels.nas.edu/report/research-progress-environmental-health/18475>