

# Nanotech protection: Current safety equipment may not be adequate for nanoprotection

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Writing in a forthcoming issue of the *International Journal of Nanotechnology*, Canadian engineers suggest that research is needed into the risks associated with the growing field of nanotechnology manufacture so that appropriate protective equipment can be developed urgently.

Patricia Dolez of the Department of [Mechanical Engineering](#), at the École de technologie supérieure, in Montréal and colleagues point out that skin is not an impervious membrane. This is the reason that protective clothing and gloves, in addition to respirators, are often an essential and common sight in the chemical industry. However, they wonder if standard protection against chemical risks is enough for workers who are handling nanomaterials.

According to the most recent estimates from the U.S. National Science Foundation, the nanotechnology market could reach as much as \$1 trillion by 2011/2012. This, says Dolez, corresponds to about 2 million workers involved in nano-related activities. She adds that it has already been shown that nanoparticles may affect biological activity through oxidative stress at the cellular and molecular levels, although these effects are yet to be manifest as health problems among workers.

The anticipated hazards associated with this incredibly diverse range of substances falling under the general and broad tag of "nanomaterials"

remain largely unknown. And, some scientists have suggested that we are vigilant to emerging health problems associated with nanomaterials. The U.S. government recently updated its National [Nanotechnology](#) Initiative strategic plan to highlight the need for an assessment of nanomaterials toxicity before production begins.

Dolez and colleagues suggest that as this area of manufacturing grows it would be prudent to develop adequate workplace protection sooner, rather than later. Indeed, those workers most likely to be exposed to nanomaterials will be working in cleaning, bagging and formulation activities as well as surface functionalisation of nanoparticles.

They explain that current regulations and standards testing for protective clothing and equipment are almost devoid of references to nanomaterials specifically. Moreover, although some researchers have concluded that certified respirators offer an appropriate level of protection against nanoparticles, there remain large uncertainties, for example due to the increased potential of leaks at face seal because of the very small size of nanoparticles, a few billionths of a meter.

More information: "Personal protective equipment against nanoparticles" in *Int. J. Nanotechnol.*, 2010, 7, 99-117

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