



Nanotech, “Toxic Socks” Raise Concerns

Nanotechnology is available at a store near you. Valued for its antibacterial and odor-fighting properties, nanoparticle silver is the star attraction in a range of products from socks to bandages to washing machines. But as silver’s benefits propel it to the forefront of consumer nanomaterials, scientists are recommending a closer examination of the unforeseen environmental and health consequences of nanosilver.



Nanotechnology is used in many forms of sportswear

Recent research is reporting that ordinary laundering can wash off substantial amounts of the nanosilver particles from socks impregnated with the material. Researchers suggest that the particles, intended to prevent foot odor, could travel through a wastewater treatment system and enter natural waterways where they might have unwanted effects on aquatic organisms living in the water and possibly humans, too. “This is the first report of anyone looking at the release of silver from this type of manufactured clothing product,” said the scientists.

Behind those concerns lies a very simple experiment. The researchers bought six pairs of name brand anti-odor socks impregnated with nanosilver. They soaked them in a jar of room temperature distilled water, shook the contents for an hour and tested the water for two types of silver — the harmful “ionic” form and the less-studied nanoparticle variety. “From what we saw, different socks released silver at different rates, suggesting that there may be a manufacturing process that will keep the silver in the socks better,” said a scientist. “Some of the sock materials released all of the silver in the first few washings, others gradually released it. Some didn’t release any silver.”

Ionic silver, the dissolved form of the element, does not just attack odor-causing bacteria. It can also hijack chemical processes essential for life in other microbes and aquatic animals. “If you start releasing ionic silver, it is detrimental to all aquatic biota. Once the silver ions get into the gills of fish, it’s a pretty efficient killer,” said a scientist. Ionic silver is only toxic to humans at very high levels. However, the toxicity of nanoparticle silver, said a scientist, has yet to be determined.

Silver has been used historically since ancient roman times, though its nanoparticle form has only recently appeared in consumer products. Beyond socks, nanosilver appears in certain bandages, athletic wear and cleaning products. Most consumers are largely unaware of these nano-additions. “I’ve spoken with a lot of people who don’t necessarily know what nanotechnology is but they are out there buying products with nanoparticles in them. Our work suggests that consumer groups need to start thinking about these things,” said a scientist. **ST**

