

**March 20, 2009**

**Subject: Docket No. EPA-HQ-OPP-2008-0650: Regulate nano-silver products as new pesticides**

Dear EPA Administrator Lisa Jackson:

We are writing to express our strong support for the ICTA/CFS legal petition.

We are a citizen organization in Wisconsin that formed after several of us participated in a consensus conference in 2005 on nanotechnology. At the end of this conference, having learned about nanotechnology's applications and implications, we compiled a report asking, among other things, that health and safety of nano-products be tested before they go on the market, that companies bear the responsibility for making sure their nanomaterial products are safe, and that information about nanomaterials in consumer products be available to consumers—see: [http://www.nanocafes.org/files/consensus\\_conference\\_report.pdf](http://www.nanocafes.org/files/consensus_conference_report.pdf)

After the consensus conference, we formed a citizens group (the Citizens' Coalition on Nanotechnology, CCoN) and organized numerous events to engage the community in discussing nanotechnology. In 2008, we became independent from the University of Wisconsin and changed our name to the Nanotechnology Citizen Engagement Organization (NanoCEO).

In 2007, we sent a letter to the National Nanotechnology Coordination Office outlining what we feel should be environmental health and safety priorities for government agencies: see [http://www.nanocafes.org/files/NNCO\\_CCON.pdf](http://www.nanocafes.org/files/NNCO_CCON.pdf). Also, around that time, the increasing use of nanosilver in consumer products and other applications came to the top of the list as a priority. In March 2007, we held a large public event to discuss this issue with scientists and citizens—see: [http://www.nanocafes.org/past\\_events/03\\_22\\_07](http://www.nanocafes.org/past_events/03_22_07). We purchased a few consumer products claiming to contain nanosilver, readily available at local markets, and had some of these products tested to see how much silver is in them and how much leaches off (e.g., potentially into food and liquids). We found that, not surprisingly, silver does leach from these products—in some cases (such as food storage bags), in significant amounts.

In our recommendations in 2005 and 2007 we asked that environmental health and safety issues related to nanotechnology (particularly those related to food and food packaging, where nanosilver is increasingly being used) be a priority for U.S. government agencies. Unfortunately, we never received a response to our letter, and four years after our original report, the government is spending little money to address health and safety aspects of nanotechnology compared to the amount they are spending on nanotechnology development.

In the meantime, even as the production and availability of nanomaterial products skyrockets, federal environmental and health agencies have been extremely slow to consider how to adequately regulate and control the unique health and safety risks related to nanotechnologies.

The ICTA/CFS have done an excellent job in their petition summarizing the increasing evidence that nanosilver poses a substantial threat to public and environmental health, and we commend

them for it. As their petition outlines very well, the widespread and uncontrolled use of nanosilver worldwide in consumer products is likely to result in increasing levels of silver and nanosilver in the environment, in workplaces, and in consumers' homes.

Environmentally, ionic silver is the second most toxic metal after mercury, and numerous studies and substantial environmental evidence show that it is harmful to aquatic organisms and many other lower organisms. Silver is assumed by many to be non-toxic to humans, yet hundreds of individual cases of argyria and various other health problems (and sometimes deaths) have been recorded related to silver exposures in workplaces and in consumer and health products.

Although most of these cases were related to very high exposures, since no long-term population-based or comprehensive epidemiological studies have been done on silver exposures, it is impossible to say what the long-term subchronic effects of lower level silver exposures are.

Even if ongoing exposures to and/or ingestion of "non-nano" scale forms of silver are safe for humans (again, this is not entirely established, given lack of quality studies), it is well-known that at the nanoscale, materials can be significantly more toxic because of their higher surface-to-volume ratios, abilities to be transported more readily through bodily barriers, and several other properties. Indeed, numerous studies have already shown that nanoscale particles, including nanosilver particles, tend to be more potent toxins *in vitro* and *in vivo* than larger versions of the same materials. Several studies have demonstrated that nanoparticles can enter cells in ways that larger scale particles cannot and often cause oxidative stress. If silver nanoparticles enter cells (whether in lower organisms, humans, animals, or plants), and continue to release silver ions there over the long-term, this could have substantial toxicological effects, since silver ions are well known to cause oxidative stress and disrupt proteins, enzymes, DNA, RNA, mitochondrial function, and several other critical cellular components and processes. It is well-known that disruption of these processes can lead to cell death, systemic health problems, and eventual disease and death in organisms.

Given all of this, we strongly support the ICTA/CFS legal petition and hope you will grant their requests, including the following:

- Nanosilver should be classified as a new substances and nano-silver products regulated as new pesticides;
- Require current and future nano-silver products to undergo mandatory EPA pre-market approval;
- Current products should be removed until and unless they receive EPA approval;
- Approval should only occur if the EPA finds that the products do not create risks to the environment;
- EPA should assess nanosilver's potential impacts on human health, particularly on children and infants, and on the environment, particularly on endangered species and their habitats;
- EPA should require manufacturers to submit any needed data about the nanomaterials and current unknowns to conduct its assessments;
- If any of the nano-silver products are approved and registered as pesticides, their use should be conditioned as necessary to protect the environment and human health, including the use of warning and approved labeling;
- EPA should also amend its regulations to require nano-specific data, testing, and risk assessments for nanomaterials pesticide products;

Also, in both our 2005 and our 2007 recommendations, we asked that more information be provided to citizens about environmental health and safety issues related to engineered nanomaterials and that more opportunities for meaningful and genuine citizen input in decisions about these issues be provided by government agencies. This is particularly critical in the case of nanosilver, given its widespread availability in consumer products and hence its eventual widespread release into workplaces, homes, and the environment. Unfortunately, to date, there have been few to no opportunities for meaningful public engagement or input on these issues.

We realize that many well-intended citizens are demanding that colloidal silver and other silver and nanosilver products remain freely available to them because they view them as very beneficial for their health. Most of these people are not aware that silver is not an essential or “natural” element for humans, nor are they aware of the substantial scientific evidence that ingesting it regularly over the long term (at levels found in some of these products) can cause permanent harm (argyria), cardiovascular and neurological problems, and even death when consumed at high doses. The companies marketing these products have engaged in highly pervasive and misleading marketing campaigns with dishonest claims about the health benefits of these products—claims which have apparently been effective in convincing substantial numbers of consumers to buy them. Consumers of nanosilver products are also likely completely unaware of the substantial evidence that silver is a known and significant environmental toxin.

We feel that a large part of the responsibility to inform the general public about the potential risks related to silver and nanosilver falls on the scientists and government agencies who have the resources and expertise to access data and information about these issues and to understand their implications. If government institutions and other powerful actors don’t inform the public and policymakers, who will? The responsibility cannot fall completely on under-funded (or completely unfunded) citizens groups and non-governmental agencies.

We appreciate very much the time and effort the EPA has put into this issue so far. We ask that the ICTA/CFS’s and our requests be addressed in a timely fashion and that we are informed of how these issues are progressing when possible and provided with future opportunities for input.

Sincerely, on behalf of the Nanotechnology Citizen Engagement Organization (NanoCEO),  
Madison, Wisconsin

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