

# Report on Potential Risks of Nanotechnology in Electronics Needs a Second Draft

It's not clear whether new report is deliberately misleading or just poorly researched

By Dexter Johnson

I have encountered both hopeless ideologies and blinded cheerleaders on either side of the nanotechnology and toxicity debate, and in my experience it is the environmentalists who are just unreachable.

Like Pavlovian Dogs, they see the term “nanotechnology” and bark back “What about the environment?”. They don’t really discern between microscopy tools and nanoparticles, never mind delineate among the vast amount of different nanoparticles. They just know that nanotechnology is untested and being foisted upon them as unsuspecting consumers by some

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you explain the situation a little bit. After all, green has as its close relative fear, but ideology’s closest kin is ignorance. There is a little you can do to overcome that, certainly the force of argument doesn’t help.

In both observing this debate and covering the issue, I have not come across any organization that has presented more faulty thinking on the subject than the [Silicon Valley Toxics Coalition](#) (SVTC).

So egregious is their thinking in these matters that I am torn between believing that it must be a deliberate misrepresentation of the issues or they just don’t know or understand them. The latest insult to our collective intelligence is their white paper entitled “[Nanotechnology in Electronics: The Risk to Human Health](#)”.



Let’s take a look at it. It starts out with a definition of nanotechnology in the first sentence that is not too bad as these definitions go. But in the next sentence manages to confuse the concept of [molecular nanotechnology](#) with the nanomaterials variety that they are no doubt railing against. This is just an introduction to the confused thinking we find further.

For instance, in the second page we are provided a glossary. At the top of the list, I guess because the list is alphabetical, are “brominated flame retardants” (BFRs). Okay, but why? What does this have to with nanotechnology or nanoparticles? In fact, if anything, it demonstrates why we should hardly be concerned about nanoparticles in electronics when 2.5 million tons of BFRs are used annually in polymers.

After presenting BFRs and explaining they have been shown to be detrimental to both human and environmental health, we are given “engineered nanopartticles” next in the glossary. A somewhat facile definition is provided “ENPs are so small they cannot be seen with a regular light microscope” but no detrimental effects are attributed to them, except, of course, that it is listed right under BFRs. Guilt by association? I am beginning to lean towards deliberate misrepresentation.

On the same page, we get the question “How Small is Small?” (Poorly informed pieces such as these spend a lot of time providing definitions, no doubt because of the author’s need for them). And for the first time, we get the term that is supposed to connote the Evil Empire: [The Nanotechnology Industry](#). I challenge anyone, including misguided environmentalists, to tell me what the nanotechnology industry is, or is supposed to be.

Of course, having a monolithic nanotechnology industry planning to do us harm for profit is a lot more satisfying and can produce amusing banners that say stuff like this: “[Nano, it’s not green, it’s totalitarian](#)”. Sigh.

Next in the SVTC report we get the questions of why nanoparticles are important and why they would be used in electronics. The answers are more or less accurate, but it’s not clear why the use of nano lithium iron oxide in rechargeable batteries is presented so ominously when it is explained that they may replace conventional batteries in laptops and cell phones.

Are conventional batteries, filled as they are with all sorts of toxic materials, any less of a threat? Or maybe the SVTC wants to eliminate laptops and cell phones all together? I ask this because when I recently suggested that [nanotech research might eliminate the need for batteries in cell phones](#), I was met with the Pavlovian response: What about the environment?

Just as a note to the SVTC the next time you put one of these together you should know that a majority of today’s Li-ion batteries already use nanofibers.

Finally, by the fifth page we get an answer to the question: How is nanotechnology used in electronics? And who is their source for an answer to this question: [The Project on Emerging Technology](#) (PET). Now I almost feel sorry for the SVTC, bad data in bad data out.

Since the PET list offers little explanation of their, shall we say, less than rigorous nanotech product list, the SVTC doesn’t present any specific examples of how nanotechnology is used in electronics either. We are just told that it is found in nearly every form of consumer electronics. You can claim that, but can you show it?

Just to add insult to injury they present “[molecular electronics](#)”. Really? Again, this is just poorly informed. Why add molecular electronics to your list of boogey men unless you had no idea of how it really fit into the universe of nanotechnology and electronics. I am leaning back towards not knowing or understanding.

Look, I am in favor of the most rigorous research into determining the risks of nanoparticles in electronics and a host of other applications and products. But if I may take the exhortation at the end of this report and turn it around it somewhat: Be an informed environmentalist.

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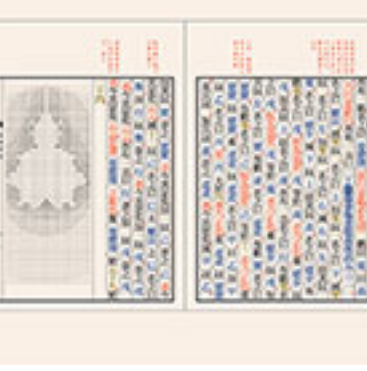
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Jaydee Hanson • 9 years ago

Dexter and Andrew:

Give some examples of how the industry is addressing the problems. You are claiming that they are addressing the problems that SVTC is raising. One of the things I have been trying to get from the nano lithium iron oxide battery folks is simply a material data safety sheet (MDSS). So far they have not sent one to me—not even for the nano battery in the Nissan Leaf.

Remember is not the environmental community that conflated the various kinds of nanotechnologies into “nanotechnology”, but rather those material scientists who thought they could get more federal dollars by having a common banner. Granted “material sciences” or “electronics” does not sound as cool as nanotechnology. And it worked for a time—The National Nanotechnology (note not Nanotechnologies) Initiative handed out a lot of federal money and tried to coordinate the spending of even more, but not a lot for the health and safety aspects of these technologies.

The Silicon Valley Toxics Coalition has done a good job of prodding the electronics industry to clean up its act over the years. I am glad that they have gotten into this area.

Finally, Dexter: Did you contact the SVTC with your complaints first? or did you just blog about them. If you contacted them first, you approach is that of a person trying to improve the product. If you just denounced them in a blog, that is not a very constructive approach. Might even be even be called a shill approach. I hope that the individual companies (many of which have talked to us at the International Center for Technology Assessment) would contact SVTC directly, not just blog their complaints. Sometimes the companies even learn what is on their websites, one company president complained that I had mistakenly said that they were using nanoscale chemicals in their products and asked where I got the information—I said “your website”. Much of the materials that the Project of Emerging Technologies list of nano products come from the companies websites. The Wilson Center and the rest of us don’t make up this stuff.

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Dexter Johnson • Jaydee Hanson • 9 years ago

Hi Jaydee,

Thank you for your comment. As to your first question, er...I mean imperative, I will leave that to Andrew to respond to since I am not sure what he was referring to exactly. However, it is interesting how you conflate your inability to get an MDSS from a battery manufacturer into the “industry” (I am assuming we’re talking about the electronics industry) not addressing risk concerns of nanotechnology.

Also, thank you for sharing the method by which The Wilson Center determines whether something is nanotechnology. I guess I am not really surprised that it amounts to little more than doing a word search on company websites. Given some of the examples of nanotechnology on the list I am not terribly surprised.

And finally, the SVTC put out a public document intended to inform, or misinform as the case may be, consumers about how nanotechnology is used in electronics and the risks this poses to their health. I pointed out some errors in thinking of the document. I didn’t need to check with SVTC about these errors because they are not a matter of opinion.

However, it is my opinion that these errors in logic are indicative of one or two things: these errors are deliberate or come from lack of understanding of the subject. Either one of these is not helpful in a document intended to inform the consumer.

Let me say, it is not my aim or my duty to pull aside every misguided environmental group and point out their sloppy thinking or lapsed research. But it is my current role as a blogger to comment on those instances when they arise. When I do, I fully expect for the usual suspects to accuse me of being a shill. It goes with the territory.

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Andrew Maynard • 9 years ago

Have to say, I agree with you on this one Dexter. There are issues with exposure to nanoscale materials in the semiconductor industry that companies and regulators need to address - and in fact are addressing. These include the use of materials such as nanoscale particles during the production process, such as in chemical-mechanical polishing. And of course, using materials such as this requires an assessment of how they are disposed of, where they go, and what impact they might have. But to conflate nanomaterials which raise legitimate concerns with products based on nanoscale engineering that probably don’t is irresponsible, and could even undermine action towards addressing plausible risks.

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Dexter Johnson • Andrew Maynard • 9 years ago

Hi Andrew,

That always seems to be the problem with these groups. It’s never enough for them to urge more research into the risks of nanoparticles, but they have to over hype the issue to the point of making it all absurd. Unfortunately, it seems you can never turn their way of thinking around to at least try and get a better handle on the topic. Instead they take any kind of criticism as the word of a biased industry shill.

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