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## *Size Matters!*

### **ETC Group: New information provides more evidence for mandatory moratorium on synthetic nanoparticles**

The ETC Group today releases a new *Occasional Paper*, “No Small Matter II: The Case for a Global Moratorium – Size Matters!” The report calls on governments to adopt a moratorium on synthetic nanomaterials that are being manufactured in the laboratory and in some cases commercialized, in the absence of testing for health, safety and environmental impacts.

“Even though industry is scaling up the manufacture of nanoparticles and carbon nanotubes there appear to be no government regulations in Europe or North America to ensure the safety of workers or consumers,” says Kathy Jo Wetter, ETC Group researcher. “A few national governments are beginning to consider some aspects of nanotech regulation but no government is giving full consideration to the socioeconomic, environmental, and health implications of this powerful new industry,” notes Wetter. The ETC Group reports that nanoparticles are already available to consumers in sunscreens (including some intended for children, from infancy onwards) and cosmetics, among other products. However, regulators do not test nano-sized materials for health, safety and environmental impacts if their macro- or micro-sized counterparts have already been approved.

“In light of this astonishing negligence,” says Pat Mooney, Executive Director of ETC Group, “and because consumers are already being exposed to synthetic nanoparticles, the call for a mandatory moratorium is the only reasonable policy response.”

Atomtech (or nanotech, as the industry prefers to call it) refers to the manipulation of matter on the scale of the nanometer, where atoms and molecules are measured in billionths of meters. Ordinary materials such as carbon, when reduced to the nanoscale, often exhibit novel and unpredictable traits such as extraordinary strength, chemical reactivity, electrical conductivity, or other characteristics that the same material does not possess at the micro or macro-scale. Companies are already producing tons of nano-scale particles (pure elements, simple compounds and composites) for use in bulk sprays, powders and coatings. Today, nanoparticles are used in the manufacture of transparent sunscreens and cosmetics, scratch-resistant eyeglasses, stain-repellant fabrics, anti-graffiti coatings for walls, and more. Some of the materials are familiar compounds that have not previously been marketed on the nanoscale. Other synthetic forms of nano-scale carbon – such as nanotubes– are being manufactured for the first time and two recent studies indicate that they can cause damage to lung tissue in mice.

According to the ETC Group, the current market for nanoparticles is small, but analysts predict it will exceed \$900 million by 2005. Some of the world’s largest companies (DuPont, BASF, L’Oréal, Hewlett-Packard, Mitsubishi, Toyota, and IBM) as well as some of the world’s smallest (NanoProducts, Nanophase, Altair) are ratcheting up nanomaterial research quickly.

Nanoparticles represent Phase I of a new industrial revolution, which the US National Science Foundation values at \$1 trillion by 2015. Atomtech cuts across every industrial sector and will affect every national economy. The potential impact of nanoparticles – for good or ill – on the environment and on human health is enormous.

“If the industry can’t be trusted with the safe development of nanoparticles, it will have no credibility when it comes to atomtech’s more sophisticated applications – such as molecular self-assembly,” says Hope Shand of ETC Group. “Unless the scientific community gets behind the call for a moratorium, the future of this emerging technology could be irreparably damaged,” says Shand.

ETC Group examines two cases of nano-scale materials that highlight the scientific muddle and regulatory vacuum: 1) the case of carbon nanotubes and, 2) the case of nano-scale titanium dioxide and zinc oxide.

ETC Group points out that three recent studies on carbon nanotube toxicity are inadequate and inconclusive. Although some researchers have found that some kinds of nanotubes can be highly toxic, no government agency is regulating laboratory research or the commercial introduction of carbon nanotubes – atomtech’s so-called “miracle molecule.”

ETC Group also highlights the potential risks surrounding titanium dioxide and zinc oxide – nanoscale materials that are widely used in over-the-counter products such as sunscreens and cosmetics. “Government regulators are ducking responsibility for nanosafety by assuming that novel nanoparticles are the same as their larger-scale relations,” points out Silvia Ribeiro of ETC Group, “but research shows that ultrafine nanoparticles could enter the human body and pose a human health hazard,” said Ribeiro.

Although nanoparticle manufacturers have suggested that they might be able to control the particle size and surface chemistry of their nanoscale materials to eliminate potential toxic effects, very few toxicology studies have been conducted. To further complicate matters, there is currently no standardized method for measuring the size of nanoparticles.

The ETC Group’s new report on nanosafety includes a 6-page paper entitled “Nano-particles and Toxicity,” authored by Dr. Vyvyan Howard of the Developmental Toxicology-Pathology unit of the University of Liverpool (UK). Among Dr. Howard’s findings:

“Research is now showing that when normally harmless bulk materials are made into ultrafine particles [nanoparticles] they tend to become toxic. Generally, the smaller the particles, the more reactive and toxic their effect. This should come as no surprise, because that is exactly the way in which catalysts are made, to enhance industrial chemical reactions. By making particles of just a few hundred atoms you create an enormous amount of surface, which tends to become electrically charged, and thus chemically reactive.”

Dr. Howard concludes: “There is considerable evidence that UFPs [ultrafine nanoparticles] are toxic and therefore potentially hazardous. The basis of this toxicity is not fully established but a prime candidate for consideration is the increased reactivity associated with very small size. The toxicity of UFPs does not appear to be very closely related to the type of material from which the

particles are made, although there is still much research to be done before this question is fully answered.”

In the absence of toxicology studies, transparent regulations and widespread public debate on the socio-economic, health and environmental impacts of atomtech, governments must act responsibly by adopting a moratorium on laboratory use of synthetic nanoparticles. ETC Group urges governments to begin negotiating a legally-binding International Convention for the Evaluation of New Technologies (ICENT).

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**The Action Group on Erosion, Technology and Concentration, formerly RAFI, is an international civil society organization headquartered in Canada. The ETC group is dedicated to the advancement of cultural and ecological diversity and human rights. [www.etcgroup.org](http://www.etcgroup.org). The ETC group is also a member of the Community Biodiversity Development and Conservation Programme (CBDC). The CBDC is a collaborative experimental initiative involving civil society organizations and public research institutions in 14 countries. The CBDC is dedicated to the exploration of community-directed programmes to strengthen the conservation and enhancement of agricultural biodiversity. The CBDC website is [www.cbdcprogram.org](http://www.cbdcprogram.org).**