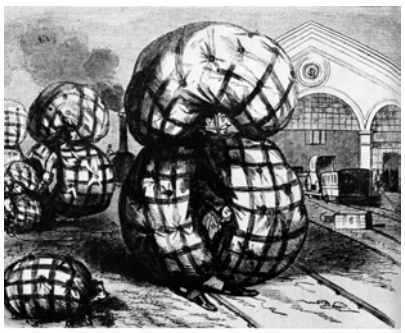
NANO-Technology Chance and/or Risk

The fear of new unknown technologies is as old as progress itself and often leads to irrational suggestions for coping with it as shown in this image.
Today we have set up our world in a way that at least in western industrial nations most people are much more independent from natural hazard and supply shortfalls than in former times.
But the conclusion from this, that people would live with much less fear, is definitively wrong.



Bekleidung gegen Eisenbahnunfälle, eine Karikatur aus dem Jahre 1847.

We just experience the contrary, actual science together with our modern means of communication spread out much more information about potential danger and risks than before and do that at an incredible fast speed. Further we have to confess, that with some of our technical advances, similar to Goethe‘s sorcerer's apprentice, we have sent for genies, that we can’t get rid of anymore today.

Modern science and industrially used technology seam to increase the speed realization of social structural changes. Today our putative future turns into reality that fast that new technologies are more and more critically questioned and fear of uncertain potentially dangerous misguided development is projected on it.

Such very emotional fear of eventual future danger attracts interest of a big audience, believing in the fear, without being able to check its scientific relevance. How tremendously dangerous such fear can get, if it goes to the extreme showed up: e.g.
In 1995, when Ted Kaczynski committed a series of assaults in the US, appealing for overcoming the „technological-industrial system“, as well as in
2011, when Andrers Breivik before his assaults in Norway issued a similar pamphlet (1500 pages), in which he had copied several passages directly from Kaczynski’s botch.

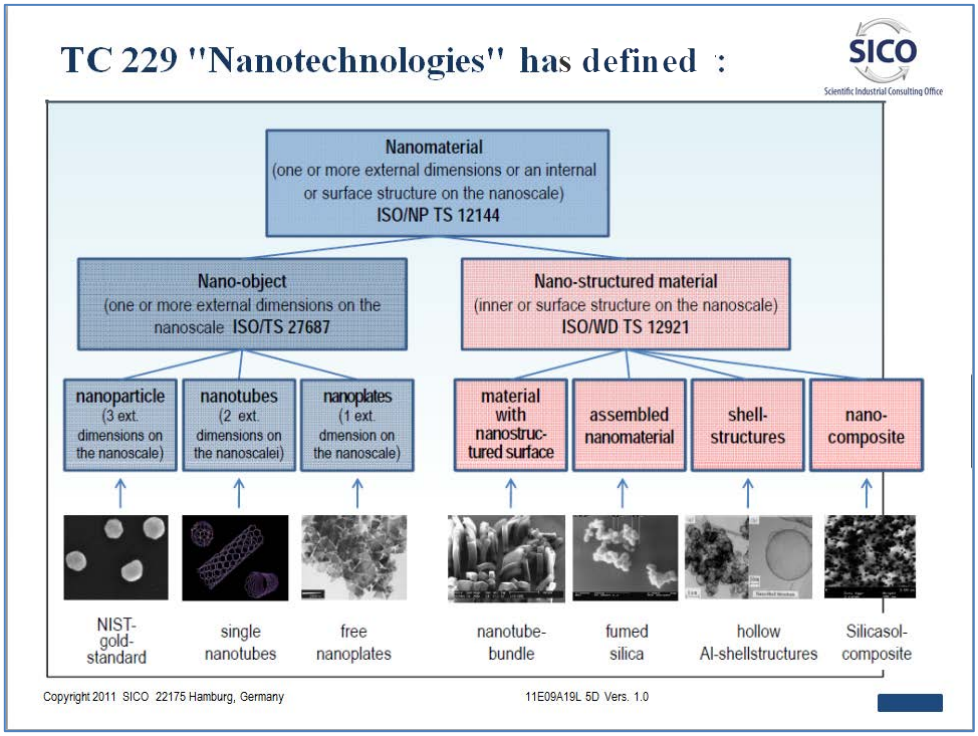
It is self-evident that we must not compare watch-guards warnings against eventual dangers of NANO-Technology to Kaczynski or Breivik directly, but with every single warning they issue, they should also worry about such extreme consequences initiated by overreaching fear.

It is imperative to have a correct scientific risk assessment without any reservation. But this cannot be established in confronting suspiciousness between environmentalists and industrial users. DV-nano tries to smooth the way between the counterparts, but exclusively based on scientific insight.

It cannot be accepted any longer, that internationally agreed, clear, science-based DIN/ISO-norms regarding NANO-technology e.g. by Greenpeace is neglected and widened after their fancy. Attracting interest of a big audience is much easier arguing unspecific and that is just the kind of publicity such non-profit „watch-guard-organizations“ live on.

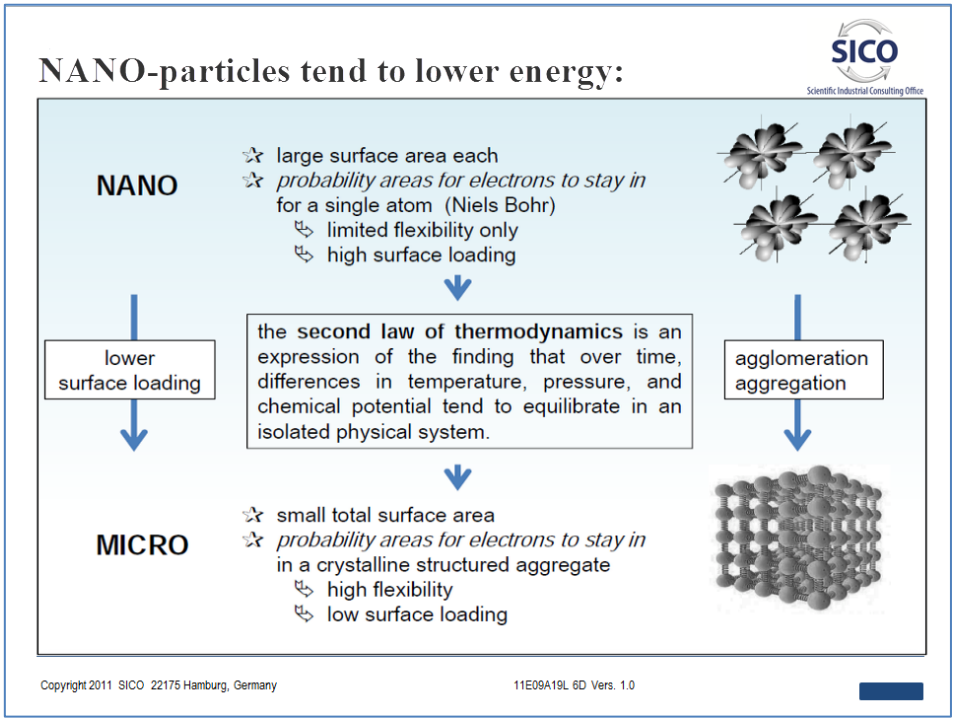
But let us concentrate on NANO-Technology again and look at its chances and risks.

First of all a sharp definition of NANO-particles is necessary.



The definition consciously discriminates between NANO-objects and NANO-structured material. The reason is that the expressed NANO-properties can only be found at NANO-objects and are nearly no longer found in NANO-structured material.

This poses the question, what are the NANO-properties based on? In oversimplified terms the NANO-properties are based on the extremely high surface charge of such very small particles.
How to visualize this?

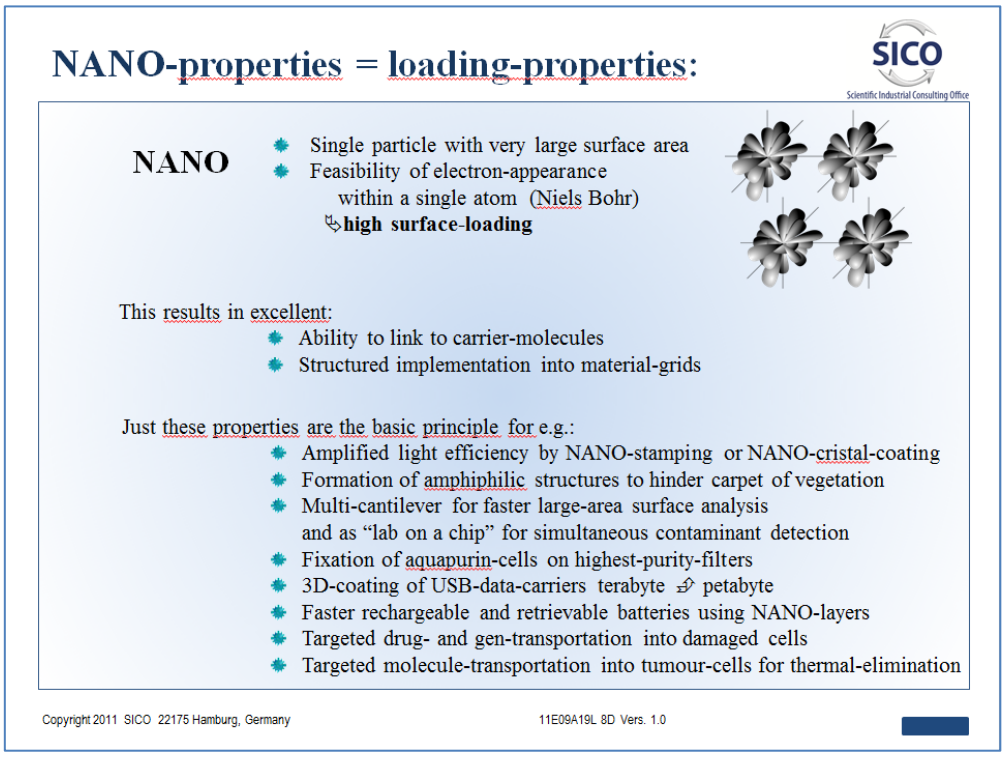


As long as the NANO-particles exist as idle single particles, they incorporate the desired NANO-properties. For this purpose they need to be strictly separated from each other, as they tend to conjunct to energetic more advantageous structures according to the second law of thermodynamics.

This kind of separation can be achieved in suspensions by covering the particles with a layer of uniform loaded ions that guaranties for repulsion from each other. Also steric (spatial) hindering by attaching long-chained molecules like in a brush can provide for long-term separation. In dry application the particles have to be fixed separated from each other in a matrix to avoid instant agglomeration.

Especially this behavior acts like an effective kind of self-protection of NANO-particles. Even in case of quarrying out a single NANO-particle from a material by means of applying high enough energy, a stabilizing environment is needed to enable the existence as a single NANO-particle for a reasonable time.

Much more interesting and relevant than partly doubtable detection of NANO-particles in cellular tissue and its influence to it, is the question of life-time of/as single NANO-particles in the actual environment. Without precise knowledge of such exposure times all contamination calculations stay to be just playing numbers that can be used for or against whatever you like. Only based on reliable data available for the lifetime of single NANO-particles in respective surrounding a trustworthy risk evaluation can be done to decide if the benefits of the NANO-properties



can justify its application and if/which safety precautions need to be taken .

It is obvious that necessary safety precautions for treating high concentrated NANO-suspensions during production will be completely different from end user awareness.

Corresponding safety instructions for production areas are available already and one can rely on, that even in small start-up-companies all members want to enjoy the success of their work in good health for long-term.

Generalizing danger scenarios based on scientifically meaningless assumptions or on a vague common anxiety only, cannot lead the way. Sorry to tell, but exactly such kind of danger scenarios show up frequently in forums of the new media as well as in all kind of papers because fear and horror always attract much more interest and publicity than a deadpan analytical report.

Conclusion: Today much more courage is needed to stand up against rabble-rousers and Luddites than to fall for their line. The ordinary argument, that industry will never confess any truth regarding NANO just because of greed of gain is as low-end and stupid as the horror scenarios themselves, but nevertheless attracting a lot of audience.

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