

Nano-particles in organic production? Issues and opinions

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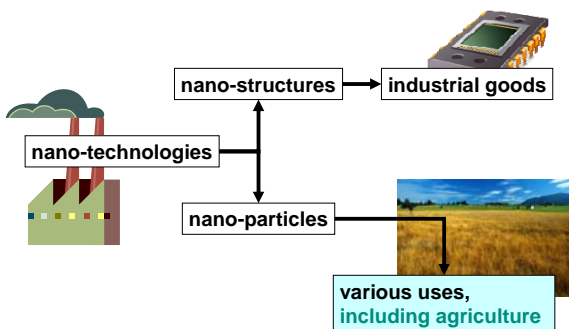
Overview

1. What are nano-particles?
2. Major issues (technical questions)
3. Some opinions in the organic sector

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nano-technologies / nano-particles



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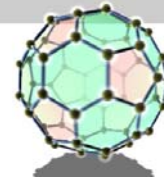


What are nano-particles?

1 Nanometer = 10^{-9} m = 1 billionth of a meter

Nano-particle = Particle smaller than 100 nm. Size range of molecules.

Note: **physical & chemical properties may change** in this range of particle size.

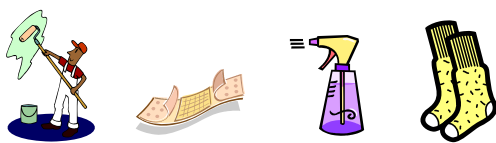
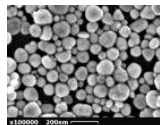


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Most frequent nano-particles (1)

> **Nano-silver** (anti-microbial):
paints, cosmetics, disinfectants,
textiles etc.



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Most frequent nano-particles (2)

> **Nano-titanium** (UV absorbant):
sunscreens, paints.

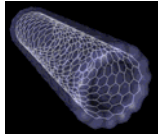


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Most frequent nano-particles (3)

- > **Carbon nanotubes** (hollow fibers): plastics & sporting equipment, electronics & batteries.



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Major issues

- > **Heterogeneity:** are all nano-particles the same?
- > **Are nano-particles natural?**
- > **What are the potential benefits of nano-particles?**
- > **What are the potential risks of nano-particles?**

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Are all nano-particles the same?

No. Nano-particles are a very heterogeneous group. Small size is their only common property.

- > **Manufacture:** physical or chemical processes.
- > **Materials of origin:** Natural or synthetic.
- > **Chemical structure:** highly variable.
- > **Physical & chemical properties:** highly variable.
- > **Uses:** highly variable.

Can we have a single opinion on such a diverse group?

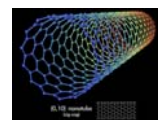
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Are nano-particles natural?

Nano-particles can be:

- > natural
- > unintentionally produced, or
- > engineered.



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Potential benefits

Nano-particles have numerous potential applications in the agriculture, food and non-food sector.

pesticides, fertilizers

food additives

cosmetics

veterinary medicine, feed (e.g. vitamins)

packaging

textiles

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... and future potential benefits ?

Nano-technologies are **key technologies** of the 21st century, and huge research efforts are made in this field.

- > New applications may become available in the future.



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Uncertainties concerning human health

- > Routes for uptake (oral, dermal, lungs) ?
- > Transport across cell membranes?
- > Transport across the blood-brain barrier?
- > Pathways & speed of excretion?
- > Physiological / toxicological effects?

Many uncertainties ...

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Uncertainties concerning environmental impact

- > Dispersal in the air?
- > Dispersal in water?
- > Mobility within plants?
- > Mobility / accumulation along the food chain?
- > Absorption in the environment (e.g. soil)?
- > Aggregation (= particles are no longer nano-size)?
- > Toxicity for various organisms?

Many uncertainties ...

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Level of regulation

Human health & environmental risks will have to be addressed by **general legislation** in the mid term.

- > Is it necessary for organic farming to make its own restrictions?

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Opinions

- > Soil Association: all uses of nano-particles currently excluded.
- > Austria Bio-Garantie: nano-particles excluded from organic cosmetics.
- > Discussion of stakeholders at BioFach 2008: more information needed, many still undecided. Need for another workshop at IFOAM World Congress 2008.

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The discussion continues ...

Workshop this afternoon:

- > 14.30 – 18.00 h
- > Faculty of Law / Giurisprudenza
- > Aula II
- > In English
- > I hope to see you there!

Thank you for your attention !

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