

Advantages and Risks of Nanotechnology

“... the biggest risk is public opinion ...”

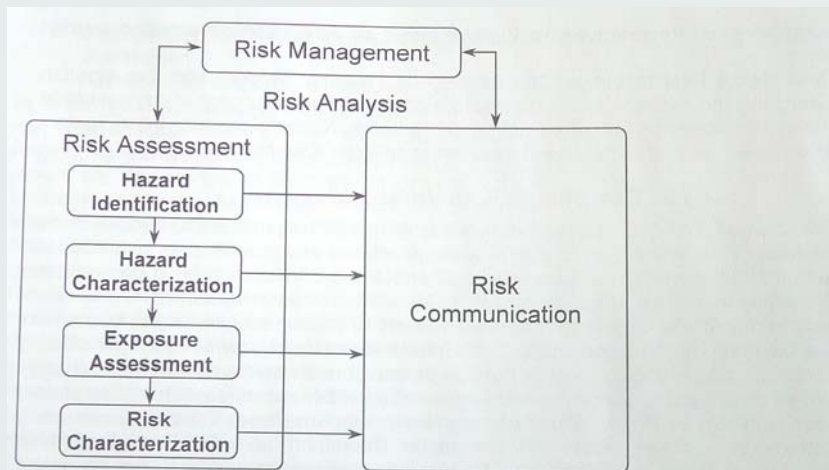


Fig. 14: The three interconnected components of risk analysis. Risk management, risk assessment, and risk communication as identified and defined by European Community (EC; regulation No 178/2002) laying down the general principles and requirements of food law that may serve as a possible basis for the exposure to nanomaterials.

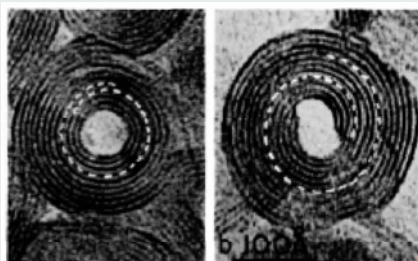
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Natural and Cultural Nano Particles

Particles in Solids -- Solutions -- Gasphase



n	Observed	Minimal second moment
4		 T_d Tetrahedron
5		 D_{3h} Triangular dipyramid
6		 O_h Octahedron
7		 D_{5h} Pentagonal dipyramid

1 μ m

Diesel engine, airplane, and powerplant exhausts

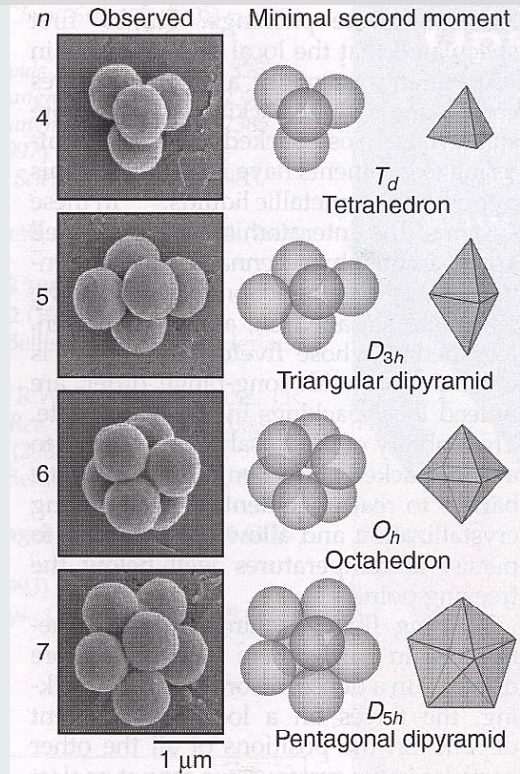
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Natural and Cultural Nano Particles

What makes the rain fall ?



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Risk and Eco-cultural Development

1. Steam engines $\rightarrow +$
2. Nuclear powerplants $\rightarrow -$
3. New pharmaceuticals $\rightarrow +-$
4. Gene therapy $\rightarrow ??$

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Specific Health Aspects

1. CNTs = blocking of trachea
2. Fullerenes = brain damage
3. Silica dust = autoimmune disorders
4. Asbestos = lung cancer

Enter body

- inhalation
- ingestion
- through skin
- may cross blood/brain barrier

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Degradation and Dissolution

1. if completely dissolvable => normal chemical data
2. if not → hardly anything known, yet

Military Uses

1. Nanotechnological weapons => forbid selfreproduction
2. Military robots
3. Combat suits

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Visions

- 1. Do not promise too much**
- 2. Explain research field properly**
- 3. Recruit young scientists**
- 4. Recruit scientists from neighboring fields**
- 5. convince politics positively**

Ongoing open risk discussion while nanotechnology proceeds