Bucharest, 12-13 November, 2012

Environmental Nanotoxicology and Nanoparticles

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Nanotoxicology and Environment in AFM for Life Sciences

EU Documents

Official Journal of the European Union

RECOMMENDATIONS

COMMISSION RECOMMENDATION

of 18 October 2011

on the definition of nanomaterial

(Text with EEA relevance)

(2011/696/EU)

Member States, the Union agencies and economic operators are invited to use the following definition of the term 'nanomaterial' in the adoption and implementation of legislation and policy and research programmes concerning products of nanotechnologies.

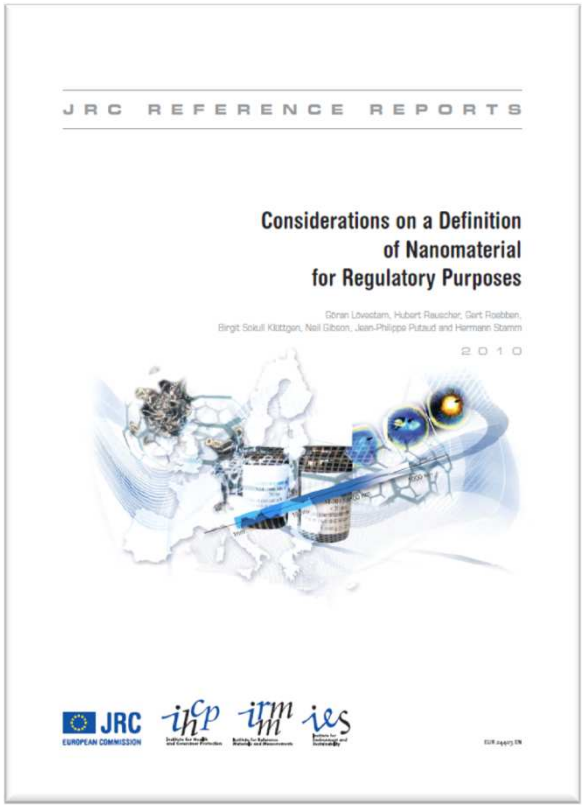
'Nanomaterial' means a natural, incidental or manufactured material containing particles, in an unbound state or as an aggregate or as an agglomerate and where, for 50 % or more of the particles in the number size distribution, one or more external dimensions is in the size range 1 nm-100 nm.

In specific cases and where warranted by concerns for the environment, health, safety or competitiveness the number size distribution threshold of 50 % may be replaced by a threshold between 1 and 50 %.

By December 2014, the definition set out in points 1 to 5 will be reviewed in the light of experience and of scientific and technological developments. The review should particularly focus on whether the number size distribution threshold of 50 % should be increased or decreased.

http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:275:0038:0040:EN:PDF

EU Documents



http://publications.jrc.ec.europa.eu/repository/bitstream/111111111/14270/1/jrc-refreport-definition-nanomaterialeur24403en.pdf

Table 1. Non exhaustive list of nanomaterials either currently used commercially or being produced in significant quantities for research or development purposes.

Aluminium	Dendrimers	Platinum
Aluminium Oxide	Dimethyl Siloxide	Polyethylene
Aluminium Hydroxide	Dysprosium Oxide	Polystyrene
Antimony Oxide	Fullerenes	Praseodymium Oxide
Antimony Pentoxide	Germanium Oxide	Rhodium
Barium Carbonate	Indium Oxide	Samarium Oxide
Bismuth Oxide	Iron	Silanamine
Boron Oxide	Iron Oxides	Silicon Dioxide
Calcium Oxide	Lanthanum Oxide	Silver
Carbon Black	Lithium Titanate	Single- and Multi-walled nanotubes
Cerium Oxide	Manganese Oxide	Tantalum
Chromium Oxide	Molybdenum Oxide	Terbium Oxide
Cluster Diamonds	Nanoclays	Titanium Dioxide
Cobalt	Neodymium Oxide	Tungsten
Cobalt Oxide	Nickel	Yttrium Oxide
Colloidal Gold	Niobium	Zinc Oxide
Copper (II) Oxide	Palladium	Zirconium Oxide

EU Projects

Project Acronyms

ENNSATOX
ENPRA
EuroNanoTox
HINAMOX
InLiveTox
INSTANT
ITS_NANO
MARINA
ModNanoTox
Nanodetector
NANODEVICE
NanoFATE
NanoHouse
NanoImpactNet
Nanolyse
NanoMICEX
NANOMMUNE
NanoPolyTox
NanoReTox
NanosafePACK
NanoSustain **AFM**
NanoTransKinetics
NanoValid
NEPHH
NeuroNano
QNano
SANOWORK
Scaffold
SIINN
SMART-NANO

The Nanosafety Cluster: highly interlinked working groups that cover the domains Materials, Hazards, Exposure, Databases, Risks, Modelling, and Dissemination

Research themes of the NanoSafety Cluster projects

- **Characterisation & measurement**
- **Exposure assessment for humans and the environment**
- **Interaction of NM with biological systems**
- **Human Health**
- **Ecotoxicology**
- **Control measures at workplace**
- **Preliminary handling guidelines**
- **Information transfer**

Nanosafety Cluster, has initiated a new action
"Strategic Research Agenda for Nanosafety Research 2020"

Research funded under the EU 8th Framework
Programme for Research and Innovation - Horizon 2020

EU Workshop

EUROPEAN COMMISSION
JOINT RESEARCH CENTRE

Institute for Health and Consumer Protection

Nanobiotechnology

International Workshop December 4th to 6th, 2012

EC Joint Research Centre, Ispra, Italy

Recent results in the field of *nanomaterials characterisation*, interaction modelling with biological and biochemical entities, and their application to aggregation characterisation *in relation to nanotoxicology* and *nanomedicine*. The different fields to be discussed will be related to techniques for nanoscale-surface physical and chemical characterisations of nanomaterials.

Tools: high resolution NMR, synchrotron radiation spectroscopies, near field techniques

AFM
no visibility

Natasha Starostina, Paul West

Sample Preparation for AFM Particle Characterization

Pacific Nanotechnology, Inc. **2005**

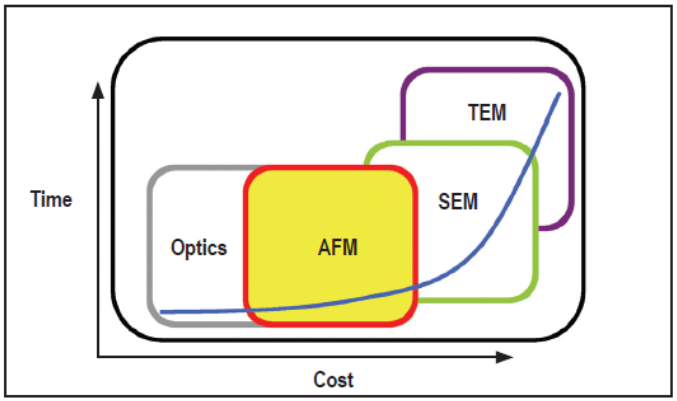


Figure 3: Analysis of the time and cost for instrumentation of microscope techniques used for characterizing particles.

NIST - NCL Joint Assay Protocol, PCC-6

Size Measurement of Nanoparticles Using Atomic Force Microscopy

National Institute of Standards and Technology
U.S. Department of Commerce

Nanotechnology Characterization Laboratory

NCI Alliance for Nanotechnology in Cancer

revised, October 2009

WG4: Environmental Nanotoxicology and Nanoparticles

- The task of WG4 is to evaluate the competence of AFM to study the toxicological properties of engineered nanoparticles in our environment or in ecologically relevant organisms as required in the emerging fields of nanoecology and nanotoxicology. The scope is very broad and multifaceted and we have to focus on the issues where AFM technology can be meaningfully applied.

- Nanotoxicology addresses the potentially toxicological interactions between nanostructured materials and living matter and investigates potential risks associated with nanomaterials during their production, use and disposal.

In the light of human toxicology related problems and environmental problems it is proposed to address the following issues:

- what is specific to AFM that cannot be achieved by other techniques
- which characteristics of engineered NP are of interest in nanotoxicology studies
- standards in environmental experiments with AFM
- metals and biological material