

N°3
June 2017



TEM OSIRIS - The Nano-characterization Platform

Summary

- The Nanomet Project
- The Cerasafe Project
- Focus on nanotechnologies standardization
- Agenda

*"The CEA-PNS team is a great R&D partner. We've have been working for several years together and their knowledge in aerosols and nanoparticles measurement has been a key point in the current performance of the **NANOBADGE-PARTICLEVER** technology. There is no such efficient place to start ambitious innovation that require customized scientific machinery."*

Raphaël de Thoury, CEO – PARTICLEVER-ALCEN

The Nanosafety Workshops 2017

As we already announced in the previous issue of our newsletter, the Nanosafety Platform is organizing, the 16th of November 2017, the first one-day session of “**The Nanosafety Workshops 2017**”.

A website fully dedicated to the event is now online. You can download the detailed program, find practical information and also register very easily!

www.ateliers2017.insight-outside.fr

Contact: ateliers2017@cea.fr

Edito

One of the main objectives of the Nanosafety Platform is to support the responsible implementation of nanomaterials in industry.

We know that some companies need tools and practical information to help them to build up their nanomaterial activity in the framework of the sustainable development.

This is the reason why we decided today to inform you about the National and European projects/tools which could contribute to your dynamic development.

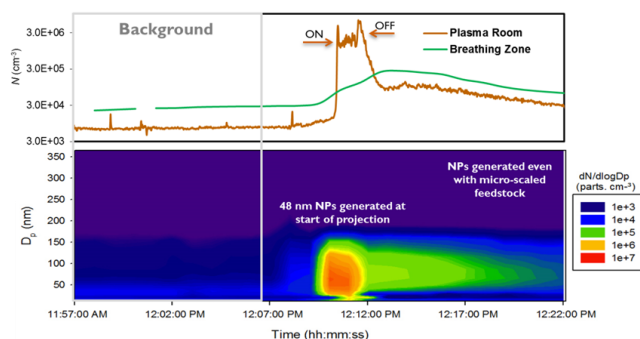
We hope this third PNS NEW'S issue will bring you interesting information !

Gaëlle Charlier, editor in chief

The Cerasafe Project

The CERASAFE project, supported by ERANET-SIINN, aims to assess and improve environmental health and safety in the ceramic industry.

The objective of this project is to study industrial processes and activities which may generate nanoparticle emissions into workplace air, and to assess worker exposure by evaluating the nanoparticle release mechanisms. Toxicity assessments will be carried out with the aim to address biological interactions of nanoceramics (in vitro and in vivo).



Moreover, CERASAFE will develop an online tool that will distinguish engineered ceramic nanoparticles from background aerosols. Mitigation measures will also be proposed.

Experiments in real-world industrial settings have already identified a high

potential for exposure to nanoparticles (Figure 1, number concentration $>10^6$ /cm³).

More information: www.cerasafe.eu

The french Nanomet Project

The aim of this project is to support SMEs in their nanomaterials characterization.

French SMEs are using more and more nanoparticles to develop new innovative materials. This implies that they are able to control metrology issues.

The NANOMET project was launched to help SMEs and to develop traceable reference measurement methods, in order to guarantee the accuracy and therefore the reliability of the measurements.

Free of charge, the documents from the NANOMET project include information on the definition, regulation and metrology of nanoparticles, as well as educational and technical sheets detailing the reference developed methods.

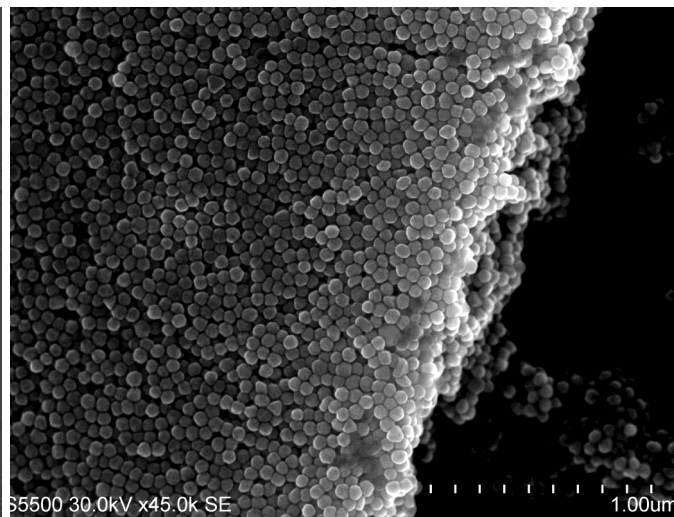
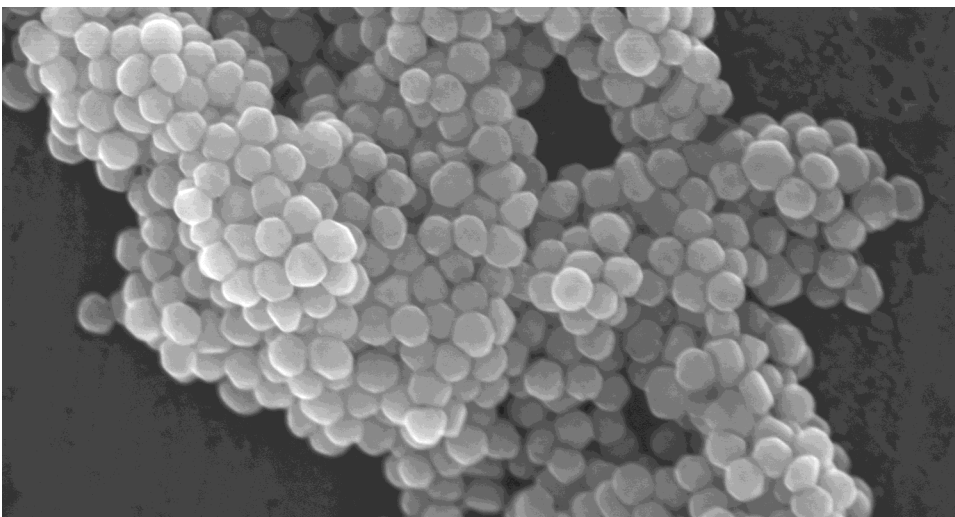
These various tools allow:

- to improve the reliability of measures carried out by companies involved in the nanomaterial field,
- to improve the competitiveness of these companies,
- to support the development of the nanomaterials sector in France.

To download these documents, go to www.nanomet.fr (the website is in French only)

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FOCUS ON...



Gold nanoparticles

Nanotechnologies Standardization

The term « standard » refers to documents established by consensus and approved by recognized body that provide, for common and repeated use, rules, guidelines or characteristics for activities. Vital elements of a nation's economy – trade, technologies, innovation, and competition – are impacted by standardization.

Voluntary standards are prepared by various standardization bodies that operate at the international (ISO), regional (CEN for Europe) and national levels (AFNOR for France, DIN for Germany, BSI for United Kingdom, ANSI for USA, etc.).

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO)

ISO is a non-government organization and network of national bodies of 162 countries. ISO's role is to facilitate the internationalization and unification of standards and related activities. The standards developed are intended to respond to market needs and are consensus based, taking into consideration inputs from all stakeholders. As voluntary consensus standards, ISO documents do not establish public policy or regulations, but they can both support public policy and be incorporated into national and regional regulation.

ISO Technical Committee (TC) 229 Nanotechnologies was established in 2005. At the end of 2016, 51 national standardization bodies are members of the ISO TC 229. 55 standards, technical specifications and technical reports, have been published and 40 new documents are under development. Five specific "working groups" are developing standards for terminology and nomenclature; metrology and instrumentation, including specifications for reference materials, test methodologies, modeling and simulations; science-

based health, safety, and environmental practices; compositions, properties and characteristics of manufactured nanomaterials; and performance-based standards for nano-enabled or nano-enhanced products and applications.

In addition to the five groups, ISO TC 229 has established three "study groups" to explore key concepts relevant to nanotechnology: Consumer and societal dimensions of nanotechnology; Nanotechnology and sustainability; Nanotechnology and biological systems.

CEN

In June 2005, CEN decided also the formation of the technical committee 352 on Nanotechnologies, based on its report "A strategy for European standardization for nanotechnologies". 33 European countries set up respective national mirror committees on nanotechnologies within their national standardization bodies. In 2007, EC issued mandate M/409 to CEN for the elaboration of a program of standards to take into account the specific features of nanotechnology and the specific chemical, physical and biological properties of nanomaterials. On February 2, 2010, the EC DG GROWTH issued a new mandate M/461 to develop standards for characterization of and exposure from nanomaterials; guidance documents and protocols in relation to occupational handling and exposure.

AFNOR

AFNOR established, for France in June 2005, the *Comité de Normalisation (CN) X457 Nanotechnologies*, as mirror committee of ISO TC 229 and CEN TC 352, which is in charge of the approval of ISO and CEN standards for the AFNOR set.

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PORTRAIT...

Equipex NanoID

Initiated in 2010, the aim of this NanoID project was to constitute **an open platform comprising different new characterization prototype equipment** able to detect and identify engineered nanoparticles with a better low limit of detection when they are present in real concentration in different complex media such as soils, plants, food, nanoproducts, biological tissues, fluids, etc.

According to the different states of the nanoproducts (solid, liquid) and of the released NPs (in liquid media, in the environment=aerosol), selected equipment have to:

- *characterize the bulk and the surface of samples for solid samples;*
- *determine the size, the chemical identification and make a quantification of NPs in dispersions;*
- *allow to freeze liquids in order to observe and identify the real state of dispersions;*
- *perform in real time to better understand what happens during a process.*

5 EQUIPMENT SELECTED

Three of them are managed by CEA/Grenoble: a **μ -waves reactor** able to produce specific home-made nanoparticles to the other equipment, a **cryogenic tomographic Transmission Electron Microscope (TEM)** able to observe and identify nanoparticles in the bulk and at the surface of solid samples or frozen dispersions and an **Assymetric Flow Field Flow Fractionation (A4F) coupled to an Inductive Coupled Plasma Mass Spectrometer (ICPMS)** able to determine the size, the chemical identification and the concentration of NPs in dispersions.



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The **X3D tomographic** equipment managed by the CEREGE (Aix-en-Provence) allows to make a multi-scale analysis in the bulk of solid samples from micron to nano size range.

The **Laser Ablation Aerosol Particle Time of Flight Mass Spectrometer** managed by the LCE (Université Aix-Marseille) allows to measure in real time NPs present in the air. It can simultaneously measure the size of the particles and identify their chemical composition.

Other partners did not acquired a tool but are involved in the general assembly. This is the case for INSERM, ANSES and UIC. 2 industrials representative of the nano-industry, ARKEMA and UIC, were also associated to the general assembly.

If you have a scientific project to share and if you are interested to have access to this open platform, please contact the NanoID team at www.nano-id.fr

For more information: www.nano-id.fr

CONTACT & ADVERTISING

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AGENDA

EuroNanoForum 2017

06/21/2017 - 06/23/2017

La Valetta, Malta

www.euronanoforum2017.eu

Nanotech France 2017

06/28/2017 - 06/30/2017

Paris, France

www.setcor.org/conferences/Nanotech-France-2017

IMBG 2017

7th International Meeting on Metallic Nanoparticles: health, Environment, applications and Safer-by-Design

09/11/2017 - 09/15/2017

Villars de Lans, France

www.imbg2017.sciencesconf.org

Consult on the INSTN website, all the training courses in relation with nanosafety

www.instdn.cea.fr

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