Because you care
about CONSUMERS' HEALTH

MERIEUX NutriSciences

Nanomaterials identification and characterization

The EU adopted a definition of nanomaterial in 2011
Recommendation on the definition of a nanomaterial 2011/696/EU

A natural, incidental or manufactured material containing particles, in an unbound state or as an aggregate or agglomerate and where, for 50 % or more of the particles have 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 %.

The Recommendation 2011/696 applies to *natural*, *incidental* or *manufactured* nanomaterials as below described:

Natural materials

occur in the environment without human intervention, as for example volcanic ashes, clay minerals

Incidental materials

means materials resulting from a human-induced process with a purpose other than producing nanomaterials, as for example combustion processes

Manufactured materials

usually refer to materials made for a specific purpose

Nanomaterials & Sustainable innovation

The identification, characterization and quantification of nanomaterials in industrial processes, products and biological media is essential for the protection of environment and human health, as well as crucial to innovate in a responsible and sustainable production, and in the product life cycle.

Thanks to the high experience in nanotechnology field, ECSIN lab, a Mérieux NutriSciences Company, has developed a multistep multi-technique approach to detect, characterize and quantify nanomaterials in industrial processes and products in many sectors.

OUR CAPABILITIES AND ACCREDITATIONS
for nanomaterials identification and characterization

Our multi-technique approach:

1. Qualitative screening
2. Size distribution and morphology
3. Chemical identification
4. Quantification
5. Exposure assessment
6. Risk assessment (if needed)

Our techniques and methodologies:

- Chemical composition and purity by mass spectrometry
- Asymmetric Flow Field Flow Fractionation (AF4)
- Morphology by transmission electron microscopy (TEM)
- Size and dimensional distribution by electron microscopy, separative methods such as flow field fractionation and light scattering methods such as Dynamic light scattering - the innovative ICP-MS single particle technique is also applied
- Specific surface area through the nitrogen adsorption method BET (Brunauer-Emmett-Teller) method
- Surface and potential charge ζ
- Dissolution and solubility with OECD standard methods and validated alternative protocols

METHOD	SCOPE DESCRIPTION
TEM	Nanoparticles size distribution
TEM-EDS	Nanoparticles identification and size distribution
A4F-ICP-MS	Nanoparticles identification, quantification (# + mg/kg) and size distribution
spICP-MS	Nanoparticles identification, quantification (# + mg/kg) and size distribution
DLS	Size distribution in nanoemulsions/nanodispersions
Z Potential	Nanoemulsions/nanodispersions stability
BET	Specific surface area

Industrial Sectors

- Food & Agriculture
- Dietary Supplements
- Food Contact Materials
- Packaging
- Medical Devices
- Pharmaceuticals
- Cosmetics
- Textile
- Construction Materials
- Chemical Products

BET
ACCREDITED

TEM
ACCREDITED

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