


# NanoMag

## **Standardization of Analysis Methods for Magnetic Nanoparticles**

An EU project within the NMP call "Metrology research for the development and validation of design rules for engineering of nanostructured and nanoenabled materials and devices".





## NanoMag – Improvement and redefinition of synthesis and analysis methods for magnetic nanoparticles towards a standardized procedure.

**The NanoMag project brings** together leading experts in synthesis, analyses and characterization of magnetic nanostructures as well as national metrology institutes. By using improved manufacturing technologies, magnetic nanoparticles with specific properties will be synthesized and analyzed with a multitude of characterization techniques. Summarizing these results will give a self-consistent picture which describes how structural and magnetic properties are interrelated.

### Who will benefit from the project?

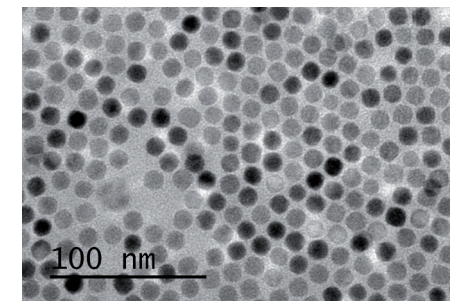
Nanoscience and nanotechnology have made a revolutionary impact on the scientific community with many new interesting research fields. New applications and products emerge in many different fields (e.g. electronics, energy environment, healthcare/medicine, and advanced materials) and these developments will most probably change our society. It is of utmost importance that in parallel with the development of nanoscience

### STRATEGIC OBJECTIVES

- Identify analysis and characterization methods that can be used to standardize measurements of magnetic nanoparticles.
- Provide valuable tools in the manufacturing process of magnetic nanoparticles and when comparing results from different labs.
- Promote the standardization techniques for both research and industrial processes.
- Provide new metrological standards for magnetic nanoparticles.

### TECHNICAL OBJECTIVES

- Correlate magnetic and structural properties of magnetic nanoparticles
- Develop new analysis methods and models for magnetic nanoparticles
- Improve the ability to follow the whole life cycle of magnetic nanoparticle systems from synthesis stage to specific applications



TEM image of magnetic nanoparticles.

and nanotechnology, regulatory work is performed that defines, standardizes and characterizes the applied nanomaterials and nanostructures that constitute a major part in the above mentioned applications. This standardization and characterization is essential for the quality of future products and for an inventory and regulation of hazardous materials and waste management.

The NanoMag results will be used to define standard measurements and techniques which are necessary for defining a magnetic nanoparticle system and for manufacturing quality control. The application areas of magnetic nanoparticles in the NanoMag project is focused on biomedical applications, for instance magnetic separation (biomolecule separation), biosensing (detection of different biomolecules), contrast substance in medical imaging methods (Magnetic Resonance Imaging and Magnetic Particle Imaging) and magnetic hyperthermia (for cancer therapy).

To ensure the validity of the NanoMag standardization procedures, a Stakeholder Committee with industrial and academic partners within this field is linked to the project. The Stakeholder Committee will

guide the research and standardization in the area of magnetic nanoparticles towards the most essential needs, relevant to both producers of magnetic nanoparticles and the end-users within this wide area. This group includes members from both small and large companies and from inside and outside the EU. It is a good mixture between partners in the field of particle synthesis and magnetic particle application areas. Stakeholder committee members actively participate both in surveys and at specific Stakeholder Committee meetings.

**In 2015 NanoMag** was identified and selected as one of the 10 very best projects out of over 1000 projects within the field of nanotechnologies and advanced materials at EuroNanoForum in Riga.

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The NanoMag project started in late 2013 and will continue until November 2017.

Visit the NanoMag website to find out more: [www.nanomag-project.eu](http://www.nanomag-project.eu)

### The NanoMag consortium

