

Project 10

Interlaboratory study of the measurement of number concentration of colloidal nanoparticles

Objectives

The proposed international inter-laboratory comparison (ILC) will initiate standardisation in the measurement of number concentration of monodisperse colloidal nanoparticles. The aims of this study are:

1. the comparative evaluation of four techniques for the number concentration measurement of colloidal nanoparticles
2. the dissemination of best practice for sample preparation, instrument calibration and accurate measurement.

The study will also set the basis for the further development of related standards and establish procedures for the generation of reference materials that are certified for number concentration.

Background and Standardization Needs

Methods have been in-house validated by the proposers within the framework of the collaborative EMPIR project Innanopart (<http://empir.npl.co.uk/innanopart/>).

Validation of these methods through ILCs will support the determination of

reproducibility necessary for international standardisation. If the ILCs indicate that the results of the methods are reproducible, new work item (NWI) proposals will be offered to ISO (ISO/TC 229 or ISO/TC 24/SC4) and/or CEN (CEN/TC 352) for standardisation.

Work Programme

Interlaboratory comparisons will be implemented to assess four methods. The samples will be provided by NPL along with a protocol. The ILC will request participants to measure the number concentration of 2 to 3 samples of 30 nm colloidal gold nanoparticles with at least one of four techniques. Participants are solicited to join one, or multiple, of the ILCs.

1. UV-Vis spectrometry,
2. single-particle inductively coupled plasma mass spectroscopy (spICP-MS),
3. particle tracking analysis (PTA)
4. differential centrifugal sedimentation (DCS).

The nanoparticles are non-agglomerated with narrow size distribution. The ILC will also request the participants to prepare one sample by diluting one of the provided colloidal samples and measure its concentration.

CALL FOR PARTICIPATION

The ILC for spICP-MS will potentially run in parallel to a [CCQM](#) pilot study organized within [BIPM](#). Should a laboratory decide to join both studies, these are designed to minimise repetition of work as they will involve the same material batch.

Note: Only National Measurement Institutes (NMI) and Designated Institutes (DI) can participate in the CCQM pilot study.

Participants must commit to following the provided protocols, although opportunity to comment will also be provided. Participants fund their own involvement in the project.

Deliverables and Dissemination

The expected output is an assessment of the interlaboratory reproducibility of methods useful for the measurement of the concentration of colloidal nanoparticles. Outcomes of the interlaboratory comparisons will be internally reported and discussed initially

with the participants. Thereafter it will be published in open literature

Status

The project started in July 2017. Samples will be provided in October - November 2017. Results should be reported until February - March 2018.

For more information:

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