



VAMAS

Project 13

Analysis of Nano-Objects using Field Flow Fractionation

Nanoparticle Populations

Technical Work Area 34

Objectives

To validate the performance of asymmetrical flow (AF4) and centrifugal (CF3) field flow fractionation techniques. In particular, their capacity to separate and size individual components of a polydisperse mixture in a reproducible manner with acceptable recovery and resolution across labs and instrument platforms.

Background and Standardisation needs

The two most widely used commercial variants of field flow fractionation, namely AF4 and CF3, were recently addressed in ISO Technical Specification 21362^[1]. Developed in technical committee 229 (Nanotechnologies), the document specifies the requirements necessary to develop, validate and apply methods based on AF4 and CF3 in nanotechnology applications. In order to promote TS/21362 to a full International Standard, it is necessary to conduct a formal interlaboratory comparison (ILC).

This study will generate critical data that will be used to assess the precision, bias and reproducibility of these two techniques using a test material consisting of a multi-component colloidal suspension and candidate certified reference material. A quality control (QC) material of the same material class will enable participants to assess their basic ability to perform the necessary measurements and help to identify any potential issues prior to analyzing the test material.

Work Programme

ILCs will be implemented to assess two techniques using different commercial platforms. Samples will be provided by the study organizers, along with protocols for each technique. A quality control (QC) sample will be included to evaluate the basic capacity of each lab to perform the required measurements. The test sample will be polydisperse and the population modes known only to the organizers.

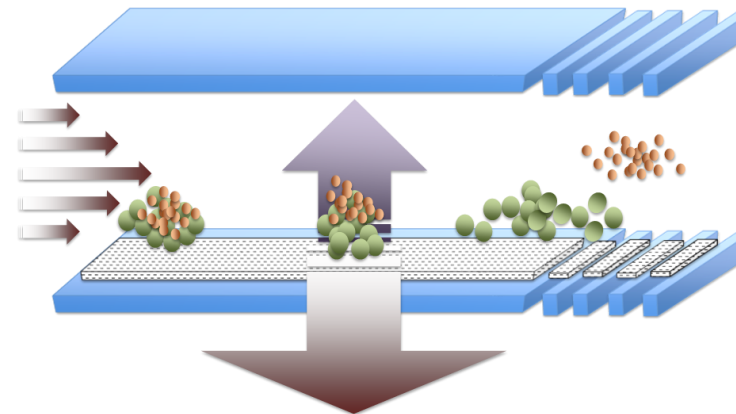
To complete the analysis, participants must have an instrument platform that includes the following detectors:

- **UV-Vis absorbance** (single wavelength is sufficient)
- **Multi-angle light scattering (MALS)** and/or **dynamic light scattering (DLS)**.

The protocols will be shared for comment prior to the start of the study for a period of two weeks. Most participants will use only one protocol, depending on which technique (AF4 or CF3) they use. The test samples are aqueous. All necessary chemicals to prepare the mobile phase are provided, as is a custom Excel file for reporting.

Three replicate fractionations will be run on both the QC and the test material, in addition to a run without field application that will be used to determine analytical recovery.

CALL FOR PARTICIPATION



Participants must commit to following the provided protocols. Opportunity to comment will be provided and any necessary deviations shall be reported.

Deliverables and Dissemination

The expected output is an assessment of the interlaboratory reproducibility, intralaboratory precision and recovery of the methods relevant to the analysis of a complex multicomponent mixture of colloidal nanoparticles. Results will be disseminated initially within the participant pool.

A summary of the ILC results will be included with the DIS/CD for balloting as an International Standard in ISO TC 229.

Participation / Funding

Participants fund their own involvement in the project. The project is scheduled for start in April/May 2020, with the expectation that results are returned within 4 - 6 weeks. Results should be reported by July - August 2020.

Reference

1. ISO TS 21362:2018 - Nanotechnologies— Analysis of nano objects using asymmetrical flow and centrifugal field flow fractionation.

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