

1st Workshop on Field-Flow Fractionation – Mass Spectrometry (FFF-MS)



On September 26th and 27th 2013 the 1st **Field-Flow Fractionation – Mass Spectrometry Workshop** was successfully held at University of Vienna (Austria). This scientific workshop was co-organized by the Department of Environmental Geosciences (University of Vienna, Austria) and the Federal Institute of Hydrology (Germany). 29 participants working in the field of nanomaterial analysis joined the fruitful workshop. Two well-known keynote speakers James Ranville (Colorado School of Mines, USA) and Francisco Laborda (University of Zaragoza, Spain) introduced to the field of single-particle ICP-MS and FFF/ICP-MS for engineered nanoparticle analysis. Afterwards, 9 presentations were given by young researchers addressing methodical challenges & solutions in applying FFF/ICP-MS and sp-ICP-MS for nanoparticle analysis on the one hand and on the other hand presenting new applications of these techniques for nanoparticle analysis in different matrices (.PDF files of the presentations are available here: <http://www.es1205.eu/archive-1/fff-ms-workshop-vienna/>).

Considering the main topics of the scientific presentations and following the fruitful discussions among the workshop participants the following required advancements in the field of FFF techniques and single particle analysis can be filtered out:

- i) Standardized protocols for sample preparation procedures are required.
- ii) The current lack of reference materials for particle size and number concentrations constrains validation of analytical methods according to standard validation procedures.
- iii) For the implementation of the European definition of nanomaterials no standardized analytical technique is available so far.

In terms of the analytical techniques the following demands were figured out:

- iv) FFF-techniques:
Particle-membrane interactions in FFF are of major importance for the development of separation methods. A significant improvement of membrane quality is required in order to achieve more reproducible results from FFF separation.
- v) Single particle ICP-MS:
 - a) There is a number of restrictions related to sp-ICP-MS analysis (e.g., only particles consisting of a single element and known density can be analyzed). This creates the need for technology development (e.g., fast scanning ICP-MS instrumentation, simultaneous detection of several masses, higher sensitivity).
 - b) So far it is challenging to distinguish between dissolved and particulate mass fraction during sp-ICP-MS. This results in difficulties to derive a particle mass concentration for the analyzed sample.

At the second day a limited number of 10 participants attended the laboratory hands on training where we performed measurements with FFF-systems online coupled to ICP-MS analysis. The attendees addressed specific questions and discussed existing technical problems further.

Once more, we would like to thank all participants and the keynote speakers making the 1st FFF-MS Workshop a successful event. All participants agreed on continuing the FFF-MS Workshop.

Therefore, in 2014 the **2nd FFF-ICPMS Workshop – Definition of Nanomaterials & Analysis** will be hosted on **September 25th and 26th** at University of Vienna. Based on demands figured out above and the currentness of the revision of the EU definition on nanomaterials in due course, we will put the focus of the 2nd workshop on analytical techniques in the context of the European definition of nanomaterials.

We are looking forward to meet you on the 2nd FFF-MS Workshop in 2014 in Vienna. For further information please visit the Workshop's website which will be updated in due course or sent us an E-Mail.

Website: <http://umweltgeologie.univie.ac.at/environmentalgeosciences-group/workshops/>

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Attendees of the 1st FFF-MS Workshop
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Vienna.