Complementarity of elemental, isotopic and molecular mass spectrometry in environmental and life sciences

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The development of trace inorganic analysis was the response to the increasing concerns about the role of chemical elements, even present at low concentrations, in the environment and living organisms.
The classical approach providing information on the total element concentration in a bulk sample has been giving way to finer approaches for trace element spatial (imaging), isotope or molecular resolution (speciation). In recent years, each of these approaches has grown into a separate field with a number of specific applications.
The lecture will address the complementarity of elemental, isotopic and molecular information to study the status, pathways and transformations of trace elements in the environment and life sciences. The topics discussed will include:

- Speciation analysis and coupled techniques: the concept of elemental speciation, the occurrence and classification of metal and metalloid species, the hyphenated techniques used in speciation analysis, the criteria of choice of a method for speciation analysis
- Focus on ICP MS detection in chromatography and electrophoresis: principles of operation, sample introduction, mass analyzers, interferences and their removal
    - GC –ICP MS: derivatization of metalloorganic species (hydride generation, alkylation, miscellaneous), technical aspects of the coupling,
    - HPLC-ICP MS: separation of metal and metalloid species, technical aspects of the coupling,
    - Electrophoretic techniques coupled to ICP MS: capillary zone electrophoresis and gel electrophoresis
    - ICP MS-assisted proteomics
- Electrospray mass spectrometry applications in speciation analysis (*de novo* identification of metalloorganic species, characterization of metal complexes with peptides and proteins)
- Complementarity of ICP and MALDI MS in bioimaging
- The potential of stable isotope labels and isotope ratio determination in environmental and life sciences
- Quality assurance and validation schemes in quantitative and qualitative speciation analysis
- Selected case studies

Termin	Dzień tygodnia	Godzina	Miejsce
30.05.2016	Poniedziałek	7.15 – 10.00	Minicentrum Konferencyjne (Luwr)
31.05.2016	Wtorek	7.15 – 10.00	Minicentrum Konferencyjne (Luwr)
01.06.2016	Środa	7.15 – 10.00	Minicentrum Konferencyjne (Luwr)
02.06.2016	Czwartek	7.15 – 10.00	Minicentrum Konferencyjne (Luwr)
03.06.2016	Piątek	7.15 – 10.00	Minicentrum Konferencyjne (Luwr)