

# The 15th Workshop on Progress in Trace Metal Speciation for Environmental Analytical Chemistry

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**Aims and topics** The Workshop on progress in trace metal speciation for environmental analytical chemistry is one of the well-known periodic meetings organized by the members of the International Association of Environmental Analytical Chemistry (IAEAC). The 15th TraceSpec conference was organized by IAEAC in cooperation with Gdańsk University of Technology and Committee on Analytical Chemistry of the Polish Academy of Sciences. It was held on September 4–7, 2016, at one of the most significant academic centers in Poland, Gdańsk University of Technology. As stated in the preface of Professor Dr. José A. C. Broekaert, President of IAEAC, “the topic is of paramount importance as the toxicologic and ecotoxicologic relevance of the elements strongly depends on their compounds and their metabolization (...), which makes the field of high actuality and of high scientific value.” The conference is aimed at exchanging ideas and establishing a scientific network in this field with the possibility of getting updated with novel equipment solutions offered by exhibitors.

**Scientific program** The 15th TraceSpec conference brought together 130 participants from 26 countries (Fig. 1) from all over the world. The 4-day program featured 59 speeches, including seven keynote lectures prepared by well-known experts (more information in the next section), 42 oral presentations, and 12 short communications intended for young scientists (under 35 years old). Moreover, almost 50 posters were presented (Fig. 2), and 10 companies exhibited field-related

instrument solutions. Two of them, SHIM-POL (Shimadzu) and Agilent Technologies, used the opportunity to share their latest improvements by oral presentation.

The poster and oral sessions were divided into 10 sections:

- QC/QA, reference materials, spectroscopic standards, and chemometric data handling
- Nutrient–metal interactions
- Speciation analysis in biological tissues and body fluids
- Total element measurements, down to ultra-trace levels in all sample types using element-specific techniques
- Speciation studies combining several techniques
- Speciation of metal(loid)s in oceanography and freshwaters
- Elemental speciation in soil and plant interaction
- Elemental speciation methods of colloids and nanoparticles
- Speciation analysis in petroleum chemistry
- Remediation technologies

Full scientific program is available at: <http://chem.pg.edu.pl/tracespec/programme>.

**Conference highlights** Looking back at the history of the Trace Metal Speciation Workshop, the major emphasis in the scientific scope has primarily been placed on environmental processes and effects studies rather than on analytical methodologies for metal speciation. From 2000, with the eighth meeting of the series, analytical chemistry became the central point of the workshop as indicated by the change of its title into “*Progress in Analytical Methodologies for Trace Metal Speciation*.” It was expected that this was an adequate approach to meet the challenges associated with studying the behavior of trace metals in the environment and their interaction with biota. The 15th Workshop’s scope was in accordance

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**Fig. 1** Participants of TraceSpec 2016 in front of the Main Building of Gdańsk University of Technology



with these expectations as separation sciences as well as methods for physicochemical parameters determination played an important role in the research presented by the delegates.

The conference was opened by Professor Nicola Pirrone with his lecture entitled “*The strategic importance of having robust and innovative methods and technologies for environmental observations to support the implementation of policy.*” In his speech, Professor Pirrone emphasized the need for advanced global observing systems for persistent pollutants. The lecture of Professor Jörg Feldmann entitled “*Arsenic speciation in mammalian tissues becomes more complex than ever*” contributed significantly to the interesting discussion in the section devoted to speciation analysis in biological tissues and body fluids. Professor Joanna Szpunar with her lecture “*Electrospray MS: (r)evolution in speciation analysis*” was definitely an inspiration for young scientists, who presented their short communications after her interesting speech. Professor Szpunar provided an overview on element and molecular selective detection in speciation analysis supported by the examples from environmental, food, and clinical analyses. The lecture of Professor Alex von Bohlen entitled “*Speciation using X-ray methods—possibilities and limitations*” was a valuable contribution to the richest section (eight oral presentations divided into two sessions) in the conference related to speciation studies combining several techniques. The lectures of Professor Pilar Bermejo-Barrera “*Speciation in the marine environment: from ions to macromolecules*” and Professor Eva Krupp “*Mercury toxicity in marine animals—accumulation and detoxification of Hg and MeHg*” show the wide variety of topics discussed in the section related to marine environment. Recent advances on analytical instrumentation for accurate determination of organometallic species discussed by

Professor Bermejo-Barrera and toxicity studies of such species in marine animals presented by Professor Krupp are both topics of high importance in the speciation field. Finally, the lecture entitled “*On the use of non-routine approaches towards understanding chemical speciation in plants*” given by Professor Ewa Bulska on the last day of the meeting highlighted the advantages of a multi-technique approach towards obtaining complementary information in element-specific investigations. This was the perfect summarizing in accordance with the keynote of the conference. The abstracts of all given plenary lectures are available at the same website as the full program of the conference.

The program included social events prepared for the delegates. The second day of conference ended with the concert of Academic Choir of Gdańsk University of Technology together with “Symfonia Nordica,” which took place in St. John’s Church. The evening of the third conference day was less official because the participants, together with the Organizing Committee, had a relaxing time during a Get Together Party.

**Awards for Young Scientists** The Scientific Committee of 15th TraceSpec conference together with the Organizers decided to reward the best presentations given by young researchers. The evaluation work was coordinated by Professor Bernd Markert, who was assisted by Professor Simone Wünschmann. Professor Markert, in his summary of the conference available at: <http://www.eisn-institute.de/tracespec-2016-gdansk/>, supported the idea of giving the young scientists their own space for presentation in the form of a separate section.

The award for the best short communication went to Kelly LeBlanc (Trent University, Ontario, Canada) for the presentation entitled “*Separating the operationally-defined fraction: discrete organic selenium speciation in high ionic strength*”



**Fig. 2** Poster session during second day of the conference in the Fahrenheit Courtyard of Main Building of Gdańsk University of Technology



*environmental samples*” and Justyna Wojcieszek (Fig. 3) (Warsaw University of Technology, Poland) for the presentation entitled “*Speciation analysis of cobalt in functional food by SEC-ICP MS.*”

The award-winning posters were: “*Separation and determination of TiO<sub>2</sub> nanoparticles in water by cloud point extraction and ICP-MS*” presented by María Carmen Barciela-Alonso (University of Santiago de Compostela, Spain), “*Isobaric dilution analysis as a new tool for speciation and ultra trace analysis of <sup>99</sup>Tc*” presented by David Clases (University of Münster, Germany), and “*Influence of cultivation conditions on biotransformation*

*of selenium in onion (Allium cepa L.)*” presented by Magdalena Michalska-Kacymirow (University of Warsaw, Poland).

**Next TraceSpec** The next Workshop on Progress in Trace Metal Speciation for Environmental Analytical Chemistry will be organized by Professor Montserrat Filella in Geneva, Switzerland, in 2018. As Professor Filella stated in her announcement, she is now working on modernization of the current format of the conference to include workshops and focus on a greater variety of analytical techniques applied in speciation analysis.

**Fig. 3** Justyna Wojcieszek, from Warsaw University of Technology (Poland), award-winning Young Scientist and Professor Jacek Namieśnik, the Chairman of TraceSpec 2016 during the Get Together Party

