

Short Course

Dr. Daniel Pröfrock

Helmholtz-Zentrum Hereon, Institut für Umweltchemie des Küstenraumes, Abteilung Anorganische Umweltchemie

Kopplungstechniken für Speziationsanalyse in Umwelt- und Lebenswissenschaften Hyphenated technique for Speciation in Environmental and Life Sciences

Short Course Abstract

The importance of speciation analysis has been predicted already more than 25 years ago. In parallel the outstanding progress made within this field strongly contributed to the improved understanding of the functional significance and possible interactions of trace elements with ecological compartments and biological systems.

Continuous progress in analytical spectrochemistry in particular within the field of hyphenated techniques has driven the focus of interest from the quantification of small, environmental relevant organometallic compounds (Hg, Pb, Sn) to the separation and identification of partly unknown biological relevant molecules containing trace elements (e.g. Proteins), metalloids (Selenoproteins) or post-translational modifications.

Various new strategies and analytical tools for the complementary application of elemental mass spectrometry (e.g. inductively coupled plasma mass spectrometry (ICP-MS)) which is still generally known as only a "metal" detector beside techniques such as ESI-MS and MALDI-TOF MS and their utilization for new, "non-traditional" application areas have been developed over the years. Within this context the experiences made from the application of proteomic techniques in the field of human diagnostics indicate some interesting possibilities also for the ecological assessment of hazardous substances in particular within the marine environment.

This short course will provide a critical overview about latest developments as well as practical issues related with the most important hyphenation approaches based on HPLC, GC or CE coupled on line with ICP-MS and their recent application for the accurate quantification of contaminants at trace levels as well as the identification and quantification of selected biomarkers. Also interface related issues will be discussed in detail, which are of great importance for the successful application of hyphenated techniques.