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Ion chromatography-ICP-MS and ESI-MS used for the chemical speciation analysis

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Abstract

Hyphenation of separation technologies and element-selective or molecule-selective detection systems is the general technique of speciation analyses. It has become a common practice in recent years to ion chromatography (LC) with inductively coupled plasma-mass spectrometry (ICP-MS) for ultra-sensitive detection of trace element of interest. Since the ICP is a destructive ionization source, it provides no inherent information about the chemical species. Thus, most speciation studies make use of HPLC-ICP-MS with known standards for compound identification via matching of retention times. However, standards are not always available and methods such as HPLC produce retention times that may vary with separation conditions, making complex identification and conformation far less rigorous than is desirable. For these reasons, ICP-MS and ESI-MS have been applied as complementary techniques, providing elemental and molecular information that together provide a complete picture of metal complex speciation. In this presentation, we give our recently work for the speciation analysis using ion chromatography (IC) and inductively coupled plasma mass spectrometry (ICP-MS) and electrospray mass spectrometry (ESI-MS). Various chemical speciation, including As, Cr, Se, V, Br, I, Sn, Zn and Pb aminocarboxylic complexes, metal-EDTA complexes were determined by both LC-ICP-MS and ESI-MS. The methods used for analysis of the real samples are also presented.

Biography

Zuliang Chen has completed his PhD from University of New South Wales at 1995 and postdoctoral studies from University of Tasmania. He is an Associated Professor at Centre for Environmental Risk Assessment and Remediation, University of South Australia. He has published more than 150 papers in reputed journals in Analytical Chemistry and Nanomaterials used for the environmental remediation.