

SCIENTIFIC RESEARCH AREAS

Hyphenated Techniques and Mass Spectrometry:

Development and evaluation of hyphenated analytical methods using spectrometric detectors. Gas chromatography with microwave induced plasma atomic emission spectrometry (GC-AED) or with mass spectrometry (GC-MS). Development of Metal Speciation methods of analysis of biological samples and Metallomics research for Bioanalysis, using modern hyphenated techniques like liquid chromatography mass spectrometry (LC-MS) or liquid chromatography plasma emission spectrometry.

Atomic Spectrometry Techniques:

Development and evaluation of analytical methods using Inductively Coupled Plasma Atomic Emission Spectrometry (ICPAES), Atomic Absorption Spectrometry with Flame (FAAS), or Graphite Furnace (ETAAS), or Hydride Generation and Cold Vapor Generation, (HGAAS and CVAAS) either in batch mode or by on-line coupling with other and automated flow analysis techniques. Also development of non-destructive methods based on X-ray fluorescence spectrometry.

Speciation analysis:

Development of analytical methods for speciation analysis of organometallic species in biological matrices using separation techniques and atomic or mass spectrometric detectors. Methods for the analysis of archaeological specimens, pharmaceutical matrices, soils and sediments, plant and animal tissues and organisms, biological fluids, food and food supplements, natural waters, silicates, alloys, standards, etc.

Sample pretreatment techniques:

Development of wet-acid digestion methods, microwave assisted digestion, liquid-liquid extraction, solid phase extraction, headspace solid phase microextraction, etc.

Chemometrics:

Analysis of Variance, Regression Analysis, Cluster Analysis, Principal Component Analysis, Factorial Designs, Experimental Design, in Analytical methods optimization, evaluation and data interpretation.