

March 26-28, 2018
Vienna, AustriaPhiliswa N Nomngongo, Insights in Analytical Electrochemistry, Volume 4
DOI: 10.21767/2470-9867-C1-005

DETERMINATION OF THALLIUM IN WATER SAMPLES USING INDUCTIVELY COUPLED PLASMA OPTICAL EMISSION SPECTROMETRY (ICP-OES) AFTER ULTRASONIC ASSISTED-DISPERSIVE SOLID PHASE MICROEXTRACTION

Philiswa N Nomngongo

University of Johannesburg, South Africa

A rapid and effective ultrasonic assisted-solid phase micro-extraction (UA-DSPME) was developed for the pre-concentration of thallium in real water samples. The ZnO-ZrO₂@AC composite functionalized with 1-(2-pyridylazo)-2-naphthol (PAN) was used as an adsorbent and the target analyte was quantified using inductively coupled plasma optical emission spectrometry (ICP-OES). The morphological, crystalline physical and chemical properties of the composite were characterized by scanning electron microscope/energy dispersive X-ray spectroscopy (SEM/EDS), transmission electron microscope (TEM) and X-ray powder diffraction (XRD). The two-level fractional factorial design and response surface methodology were used to optimize experimental parameters affecting the pre-concentration procedure. Under optimum conditions, the enrichment factor (EF), limits of detection (LOD) and quantification (LOQ) were found to be 112, 0.25 ng L⁻¹, and 0.84 ng L⁻¹, respectively. Furthermore, intra-day and inter-day precisions expressed in terms of relative standard

deviation (RSD) were found to be 2.4% and 4.3%, respectively. Moreover, the linear dynamic range was between LOQ and 350 µg L⁻¹ with the correlation coefficient of 0.9966.

Biography

Philiswa N Nomngongo completed her PhD in Chemistry (specializing in Analytical Chemistry) and Post-doctoral studies from University of Johannesburg, South Africa. She has worked as a Lecturer and Professor of Analytical Chemistry at University of Johannesburg. Her main research objective is to develop and apply different sample preparation methods for extraction and pre-concentration of trace organic and inorganic analytes in different sample matrices prior to the chromatographic or spectrometric determination. Her research also focuses on the application of nanotechnology for environmental pollution monitoring, desalination and water treatment. She has published more than 40 papers in highly rated and high impact international journals.

pnnomngongo@uj.ac.za