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Application of electrochemical sensors able to discriminate against arsenic species relevant for food safety assessment

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A rsenic occurs naturally in the environment, food and water in more than 50 different compounds, which present a great range of toxicity from lethal (arsenite) to harmless (arsenobetaine); therefore the chemical form of As is critical for risk assessment. The human health issue concerning the presence of arsenic in food and beverages has created a need for methods able to separate and quantitatively measure these species. The matrices of interest are several, but marine organisms (e.g. algae, mollusks and fish) and rice products (e.g. rice, flour, biscuits, milk) are the most important: The former ones because the total As concentration is generally high due to biological accumulation and the second ones because rice products are the base of the diet in several countries and a good alternative to wheat products for celiac people. The analytical technique commonly used in the As speciation analysis is the HPLC-ICPMS coupling, due to its versatility, selectivity and sensitivity; however, it is an expensive technique, notsuitable to carry out fast and decentralised analyses. The aim of the present work is the evaluation of the response of new electrochemical sensors (ensemble of nano electrodes) as a function of the arsenic chemical form by performing duplicate analyses of aqueous extracts from various types of seafood and rice products. The comparison of the developed sensors with well-established analytical procedures based on HPLC-ICPMS will lead to the validation of electrochemical device selective to the toxic arsenic species and suitable for the needs of routine monitoring of food products.

Biography

Amanda Terol Pardo is working as a Researcher in the field of food analysis since 2007. She obtained her international PhD studies last 2012 in the University of Alicante, in the department of analytical chemistry, nutrition and food science. At present she is working as a Postdoctoral researcher in the Chemistry and Industrial Chemistry Department at the University of Genoa (Italy). She has participated in numerous congresses and has published 8 papers and 3 chapters in well-regarded journals and books.

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