Advanced analytical techniques in ELECTROACROSS. Matrix characterization and monitoring electrokinetic processes in recovery, remediation and conservation

Abstract of poster presentation

Ribeiro, A.B.; Mateus, E.P.; Marriott, P.; Ferreira, C.D.; Ottosen, Lisbeth M.; Rodriguez-Maroto, J.M.; Hansen, H.K.; Pamukcu, S.; Nekrasova, M.; Zhou, D.

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ADVANCED ANALYTICAL TECHNIQUES IN ELECTROACROSS. MATRIX CHARACTERIZATION AND MONITORING ELECTROKINETIC PROCESSES IN RECOVERY, REMEDIATION AND CONSERVATION

A. B. Ribeiro[1,2], E. P. Mateus[1,2], P. Marriott[1], C. D. Ferreira[3], L. M. Ottosen[4], J. M. Rodriguez-Maroto[5], H. K. Hansen[6], S. Pamukcu[7], M. Nekrasova[8], D. Zhou[9], M. Ribau Teixeira[10], Z. L. Cardeal[11]

[1]Centre for Green Chemistry, School of Chemistry, Monash University, VIC, Australia
[2]CENSE, Faculdade de Ciências e Tecnologia, Universidade Nova de Lisboa, Portugal
[3]CERNAS, Escola Superior Agrária de Coimbra, Portugal
[4]Department of Civil Engineering, Technical University of Denmark, Denmark
[5]Department of Chemical Engineering, University of Málaga, Spain
[6]Department of Chemical and Environmental Engineering, Universidad Técnica Federico Santa Maria, Chile
[7]Department of Civil and Environmental Engineering, Lehigh University, United States
[8]People's Friendship University of Russia, Russian Federation
[9]StateKey Lab of Soil and Sustainable Agriculture, Institute of Soil Science, Chinese Academy of Sciences, China
[10]CENSE, Universidade do Algarve, Portugal
[11]Department of Chemistry, ICEx, Federal University of Minas Gerais, Brazil

The project Electrokinetics across disciplines and continents: an integrated approach to finding new strategies for sustainable development - ELECTROACROSS was approved under the frame of FP7-PEOPLE-2010-IRSES. Started on March 2011, it will last for 4 years. Its main aim is to establish a long-lasting collaboration and create a network of European and other continents' research centers of excellence, to explore new strategies for sustainable development, using electrokinetics (EK) in different disciplines, including recovery, remediation and conservation. Under the project, the development of new analytical methodologies for the characterization of complex environmental polluted matrices and comprehensive monitoring of remediation processes is an important aim. The set up of a remediation strategy requires the prior characterization of the polluted matrices in terms of chemical composition and its success improves with the quality of this characterization. The use of advanced analytical techniques (e.g. multidimensional GC and GC×GC), as a tool for monitoring and elucidation of the behavior of organic contaminants present in complex matrices when submitted to the EK processes, has already been applied to creosoted-treated railway sleepers. Further studies are underway at the Centre for Green Chemistry and will proceed among partners, to create advanced synergies among fundamental research, applied science and innovation.

The major societal objective is to address the problem of ever increasing pressures on land resources that create competition and conflicts and result in suboptimal use of these resources through expanding economic activities and human demands. Contaminated soil and a great deal of waste products are currently disposed of in landfills. The call for more sustainable solutions is decisive to support waste strategies. This project opens new technical possibilities for waste minimization, through upgrading of particulate waste products and the recovery of secondary resources for industrial use. The envisioned use of sustainable EK processes in resource recovery, remediation and conservation is a triple-pronged approach, with worldwide interest.