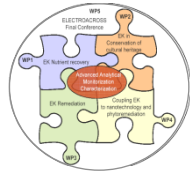


DCEA - Department of Environmental Sciences and Engineering

Upgrade of environmental matrices

Center for Environmental and Sustainability Research
Environmental assessment, monitoring and remediation
Lab. 347 – Remediation Group



ELECTROACROSS



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PhD in Environ. Sci. Technol.
- Biological remediation technologies applied to soils contaminated with hydrocarbons, in an industrial context. Current research is devoted to electrokinetic remediation

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Objectives

- Electrokinetic (EK) process as a tool for an integrated solution for removing both inorganic and organic contaminants from different matrices (incinerated sewage sludge, membrane concentrate) and parallel recovery of specific elements aiming further application in agriculture or industries (e.g. phosphorus);
- Synergistic effects resulting of simultaneous application of more than one remediation technology (EK assisted phytoremediation);
- Remediation of organic contaminants in cold climatic regions (biological approaches);
- Volatile organic compounds emitted by plants exposed to abiotic stress factors.

Methodology

- Soil and other waste materials are being tested in laboratory or greenhouse environment.
- Applying a low level direct current, EK promotes the movement of species out of the contaminated matrix, towards one of the electrode compartments, where they are concentrated and may be removed.
- The variables under study (individual and combined effects) are in evaluation process.
- To study and optimize electrokinetic process advanced analytical techniques (e.g. GC×GC) for matrix characterization and contaminants monitorization are being applied, in parallel, with “classical” analytical techniques.

Expected Results

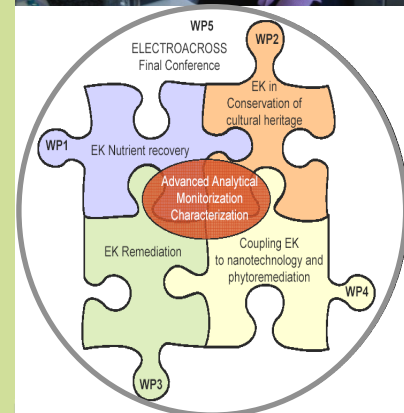
- It is expected to establish the best conditions for EK performance in waste streams which can be a source of important secondary resources that nowadays are lost. In parallel, the potential to remediate these target matrices will provide insights about EK applicability;
- It is also expected that the acquired knowledge about electrokinetic assisted phytoremediation, an innovative technique, will enlarge the scope of EK application.
- Main research findings can contribute, ecologically and economically, to a sustainable management of deleterious materials.

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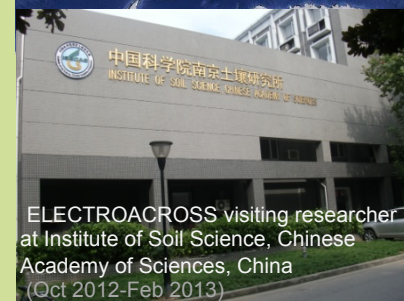
Our team in the lab



ELECTROACROSS - Electrokinetics across disciplines and continents: an integrated approach to finding new strategies to sustainable development



Partners in the ELECTROACROSS project



ELECTROACROSS visiting researcher at Institute of Soil Science, Chinese Academy of Sciences, China (Oct 2012-Feb 2013)