Department of Electrical Engineering and Information Technology

Master thesis

Electrochemical detection of halogenated organic compounds (HOCs): Flame retardant and polychlorinated biphenyls

Project description

Halogenated organic compounds (HOCs) ranked among the priority environmental contaminants in the European Union. Their-large scale entry into the environment has led to soil and water pollution with a severe adverse effect on human health and environmental quality. Thus, there is a continuous drive for monitoring and quantification of (HOCs) in various environments.
The project focuses on the implementation of different electrochemical techniques e.g., potentiometry, amperometry, voltammetry and Impedimetric for quantification analysis of HOCs.

Tasks:

- Fabrication of an electrochemical sensor utilizing diverse materials, such as metal complexes, carbon-based nanomaterials, metal nanoparticles, and a conductive polymer.
- Electrochemical, spectroscopy, and microscopy characterization of the designed sensors
- Using the proposed sensors for HOCs detection by various electrochemical approaches

Competences:

- Completed scientific university degree in the field of electrical engineering, physics, chemistry, advanced functional materials, or comparable disciplines, which opens access to the corresponding qualification level.
- Knowledge in the areas of impedance spectroscopy, electrochemical methods, or surface chemistry and modification is an advantage.

Contact:

Dr. Saddam Weheabby

Electrical Engineering and Information Technology
Chair of Measurement and Sensor Technology
Email: saddam.weheabby@etit.tu-chemnitz.de