Task Description

Carbon Nanomaterials are considered promising nano-fillers owing to their excellent mechanical, thermal and electrical properties. They can be used in many multifunctional sensor applications when they are combined with polymers.

However, due to complexity of the composites, it is challenging to understand their complex conduction mechanism. Therefore, a comprehensive electrical characterization is needed. Among many characterization approaches, Electrochemical Impedance Spectroscopy (EIS) is a well-developed non-destructive frequency domain process and quite powerful tool which provides quick and a wide range of information about the individual contributions within a material. The objectives of this project are:

- Impedance characterization of different CNM/polymer composites.
- Consistent equivalent circuit modeling of the composites and corresponding parameter extraction.
- Comparison of the impedance behavior of different composites.

Requirements

- Good knowledge of basic electronic circuit components and design
- Fundamental knowledge of solid-state physics, chemistry and nanotechnology
- Self-learning ability, creative thinking and motivation to work independently

Supervisor

M. Eng. Abdulkadir Sanli
Electrical Engineering and Information Technology
Chair of Measurement and Sensor Technology
Email: abdulkadir.sanli@s2012.tu-chemnitz.de