Abstract

Impedance spectroscopy is destined to play an important role in fundamental and applied electrochemistry and materials science. In a number of respects it is the method of choice for characterizing the electrical behaviour of systems in which the overall system behaviour is determined by a number of strongly coupled processes, each proceeding at a different rate.
With the current availability of commercially made, high-quality impedance bridges and automatic measuring equipment covering the millihertz to megahertz frequency range, impedance studies have become increasingly popular as more and more electrochemists, materials scientists and engineers understand the theoretical basis for impedance spectroscopy and gain skills in the interpretation of impedance data.
Surface, interface- and bulk-properties of materials can be studied, which includes the determination of absorptionrates and reactionrates, double layer capacities, ionic and electronic cinductivities, diffusion constants. These properties have different frequency response and may be separated by using AC techniques in a frequency range from 10^{-5} to 10^{6} Hz.