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Nota di contenuto	Frontmatter -- Preface -- Contents -- List of Contributing Authors -- Impedance spectroscopy advances and future trends: A comprehensive review / Kanoun, Olfa -- Part I: Electrochemical and physical phenomena -- Study of the humidity effect on the electrical impedance of MWCNT epoxy nanocomposites / Sanli, Abdulkadir / Benchirouf, Abderrahmane / Müller, Christian / Kanoun, Olfa -- Temperature influence on impedance of premium summer diesel fuel measured with the use of impedance spectroscopy / Macioszek, Lukasz / Rybski, Ryszard -- A study of the effect of short-term relaxation on the EIS test technique for EV battery cells / Barai, Anup / McGorden, Andrew / Jennings, Paul -- Humidity sensitivity investigation of reduced graphene oxide by impedance spectroscopy / Al-Hamry, Ammar / de Torres, Renato Veiga / Müller, Christian / Kanoun, Olfa -- Impedance study of Ni-Cr alloy in contact with biologic and organic solution using constant phase element / Leguedani, Nouredine / Hafid, My Mustapha / el Idrissi, Siham Yazami / Kessad, Yousra -- Part II: Measurement systems -- Influence of the settling behavior on the measurement uncertainty of EIS and how to decrease the measurement duration / Baumhöfer, Thorsten / Rothgang, Susanne / Sauer, Dirk Uwe -- Mixed-level simulation tool for design optimization of electrical impedance spectroscopy systems / Lamlih, Achraf / Kerzérho, Vincent / Bernard,

Serge / Soulier, Fabien / Comte, Mariane / Renovell, Michel / Rouyer, Tristan / Bonhommeau, Sylvain -- A highly scalable FPGA implementation for cross-correlation with up-sampling support / Schmidt, René / Blokzyl, Stephan / Hardt, Wolfram -- Interface circuit for oil quality assessment considering dielectric losses and stray capacitances / Fendri, Ahmed / Jribi, Racem / Kanoun, Olfa / Ghariani, Hamadi -- Part III: Sensors -- Modeling for improved performance of non-contacting capacitive sensors for detecting aqueous solutions / Weber, Christian / Tahedl, Markus / Kanoun, Olfa -- Eddy current corrosion measurement of steel / Mörtens, Olev / Land, Raul / Min, Mart / Rist, Marek / Ferenets, Marju / Käsper, Andres -- First measurements with a radiation hard relative humidity sensor for the ATLAS Experiment / Tobehn-Steinhäuser, Ingo / Kersten, Susanne / Stauffenberg, Jaqueline / Wünscher, Heike / Zeitnitz, Christian / Ortlepp, Thomas -- CNT-enhanced carbon electrode for nitrite detection and water analysis / Wendler, Frank / Aurosmit, Paul / Kanoun, Olfa -- Part IV: Bioimpedance measurements and methods -- Energy-efficient pulses for deep brain stimulation / Gordon, Rauno / Min, Mart / Land, Raul -- How many frequencies to use in electrical bioimpedance measurements / Ojarand, Jaan / Land, Raul / Min, Mart / Rist, Marek -- A method of intra-ventricular bioimpedance spectroscopy to estimate the dynamic volume of right ventricle / Kink, Andres / Rist, Marek / Land, Raul / Kõiv, Hip / Min, Mart

Sommario/riassunto

Impedance Spectroscopy is a powerful measurement method used in many application fields such as electrochemistry, material science, biology and medicine, semiconductor industry and sensors. Using the complex impedance at various frequencies increases the informational basis that can be gained during a measurement. It helps to separate different effects that contribute to a measurement and, together with advanced mathematical methods, non-accessible quantities can be calculated. This book covers new advances in the field of impedance spectroscopy including fundamentals, methods and applications. It releases scientific contributions from the International Workshop on Impedance Spectroscopy (IWIS) as extended chapters including detailed information about recent scientific research results. The book includes typically subsections on: Fundamental of Impedance Spectroscopy Bio impedance Techniques and Applications Impedance Spectroscopy for Energy Storage Systems Sensors Based on Impedance Spectroscopy Measurement systems Excitation Signals Modeling Parameter extraction