

## Preface

It is a great pleasure for the Bulgarian Electrochemical Society to present this special issue of Bulgarian Chemical Communications in honor of Prof. Zdravko Stoynov in appreciation for his enormous contributions to the development of the Electrochemical science and Electrochemical Impedance Spectroscopy in particular. On the occasion of Prof. Stoynov's 80th anniversary, we celebrate his brilliant academic career, which has lit over half a century with the sparks of innovation.

The cross-disciplinary expertise of Prof. Zdravko Stoynov covers a vast area of scientific fields and disciplines. For his original experiments and findings he develops non-standard and unique equipment, writes specialized software and applies sophisticated mathematical and statistical tools. He introduced the application of digital frequency response analyzers in electrochemistry and pioneered the idea of impedance measurements out of equilibrium. Together with the team of Prof. Epelboin, he measured impedance of batteries for the first time in the world and continued with the development of the now widely applied 4D non-stationary impedance analysis. Two of the papers in this issue exploit this advanced technique, which vastly increases the information capability of impedance spectroscopy. Stoynov's Differential Impedance Analysis ensures both structural and parametric identification without the need of preliminary working hypothesis. His Differential Coulometry Spectroscopy method for kinetic studies of batteries entered in the newest equipment of Bio-Logics (Fr). The Rotating Fourier Transforms, cited in this issue by Boris Grafov and co-workers, are already entering in huge application area. In the moment, Prof. Zdravko Stoynov is still hard at work, is developing new tools for evaluation of state of health and lifetime of batteries and fuel cells.

Prof. Stoynov's activities are part of the joint efforts of a unique generation of original scientists from many countries, who established and developed impedance society into an integral part of the electrochemical society. Through the Electrochemical Impedance Spectroscopy Symposia and the European Electrochemical Impedance Analysis Symposia, they have put EIS on the map and have nurtured a community of

scientists in the field for the past 30 years. To this day, Zdravko Stoynov's voice is highly regarded during those meetings as an insightful guide for the next generation of scientists.

Prof. Stoynov has insightfully played an integral role in the development of regional and national electrochemical science during the last decades. He has strongly been supporting the electrochemists from South-East Europe in the establishment of the Regional Symposium on Electrochemistry – South East Europe (RSE-SEE). He chaired the Bulgarian Electrochemical Society with its biannual symposium Sofia Electrochemical Days, focusing on the representation and growth of the next generation of Bulgarian electrochemists. He has also focused on the integration of Bulgaria into the International Electrochemical Society through the establishment of the Bulgarian Section of IES. We are happy to mark the strong contribution of many scientists from these organizations in this special issue of Bulgarian Chemical Communications, which comprises 31 papers with the participation of researchers from 12 countries from Europe, Asia and America (Bulgaria, Croatia, Czech Republic, France, Hungary, Italy, Korea, Rumania, Russia, Serbia, Slovenia, USA).

Our intention as editors was to design a non-standard and original issue, to reflect as much as possible the unique person to whom it was dedicated. We think that we succeeded thanks to all the contributors who offered original papers both as form and as content. The book was designed to comprise several parts:

- "Stories" about electrochemistry in the second part of the 20th century and the people behind it, about the spirit and atmosphere created by the "fathers" that developed the fundamentals on which today's electrochemistry germinated and flourished. We are happy to announce that this part, named "The Fathers", came into being with the strong contribution of Prof. Stoynov who wrote about his teacher in electrochemistry – Acad. Evgeni Budevski.

- Review papers in Electrochemistry. For the realization of this part we would like to thank another pioneer in impedance and in electrochemistry – Prof. Digby Macdonald, as well as to his younger colleagues Roxana Apetrei

from Rumania, Zoran Mandi from Croatia and Marin Pandev from Bulgaria.

- Scientific contributions in the field of Electrochemistry - original results, not published in other journals. We are happy to present 22 scientific contributions, which demonstrate the vast application areas of electrochemistry, as well as its continuing development.

- Letters to the editor – one classical dissemination form applied strongly in scientific journals in the last century, ensuring a platform for discussions on some challenging and/or contradictory topics. After consultation with Prof. Stoynov, we are offering one topic in which the question starts from the title.

In addition to those parts of the special issue, you can find a review of Prof. Stoynov's multidisciplinary activities. The Bulgarian Academy of Sciences awarded Prof. Zdravko Stoynov with the special medal of the President of BAS in recognition of his entire scientific and academic activities: outstanding contributions to

electrochemical impedance science and its applications in electrochemical power sources and recognized exceptional service in favour to the Bulgarian Academy of Sciences as an outstanding national research center.

With this special issue including reviews and latest achievements, the international electrochemical community thanks Prof. Zdravko Stoynov for his enormous contributions in the development of the electrochemical science and its scientific society.

For us as guest editors it was a great honor and pleasure to coordinate the activities of the international electrochemical community. We would like to thank them for the enthusiasm, efforts and dedication in the preparation of the papers. We would also like to thank the reviewers for the precise and accurate work. We wish to express our gratitude to Dr. Gergana Raikova, Mr. Georgi Pchelarov, Dr. Milena Krapchanska and Mr. Marin Pandev for devoting their energy and time for the preparation of this issue.

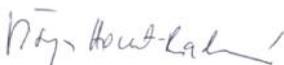
Finally, we all join the wishes of Prof. Michel Keddam for Zdravko Stoynov's 80<sup>th</sup> anniversary, saying together:

*"Please, keep on working hard...so many discoveries are still ahead".*

Guest Editors:



Daria Vladikova



Višnja Horvat-Radoševi



Tamás Pajkossy

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