

## PREFACE from Guest Editors

Dear readers,

With this special issue, dedicated to the 100<sup>th</sup> anniversary of the Department of Analytical Chemistry at the Faculty of Chemistry and Pharmacy of Sofia University, we are delighted to share with you the most recent scientific works of some of its staff members, graduates, collaborators, and guests, working in the broad areas that cover the analytical chemistry science. Rather reasonably, it starts with the historical and philosophical perspective given by one of our respected colleagues, Professor DSci Vasil Simeonov, who nicely links the ancient views on “*analitika*” to the 100<sup>th</sup> anniversary of our Department.

A quick look back at the history of our times takes us to the year 1924, when Professor Zahari Karaoglanov divides the existing then Department of Inorganic and Analytical Chemistry into two

separate units, and thereby becomes the founder of the first Department of Analytical Chemistry in Europe. Through this century of active work, an inspiring list of publications has been left for the next generations of scientists, which includes 94 books, 2401 journal articles and 106 dissertations, and hopefully its quantity and quality will increase. Numerous are the achievements of all 71 staff members through the past years that mentioning here would be unacceptably voluminous. Nevertheless, we are proud to note that three of the most cited (top 2%) scientists in the field of Analytical Chemistry in the Scopus-based list with standard Science-Metrix classification (the so-called Stanford ranking) for 2023 are colleagues from our Department – Prof. DSci Dimitar Tsalev, Prof. DSci Vasil Simeonov and Prof. Dr Irina Karadjova.



*A snapshot of the Department's life is shown in the photos taken on its 70<sup>th</sup> and the 100<sup>th</sup> anniversaries.*

With the Anniversary celebration on October 3<sup>rd</sup>, followed by an international scientific session with more than 40 presenters, and the collection of scientific papers in this special issue of BCC we express our sincere respect and gratitude to our Teachers, Supervisors, Collaborators and Colleagues.

The current special issue includes 21 research communications, which attempt to showcase the topics that have been developing in the last several decades in our Department through many fruitful and interdisciplinary collaborations. We start

with a set of 5 studies dealing with the water quality analysis from different perspectives – from ICP-MS measurements of metal ions content and chemometric analysis by time series, continuing with non-chromatographic speciation analysis (ICP-OES) of Sb ions by polymeric sorbent that contrasts the studied anion content through ion chromatography and the suggested risk analysis of Sofia city drinking water for pharmaceutical residues quantified by means of liquid chromatography (LC-MS). Further on, gas chromatography (GC-MS) was applied to the described toxicological screening in a case study of

drug poisoning, whereas the following two papers deal with organic pollutant removals by means of either gamma radiation or photocatalysis employing improved conditions and materials. The design, development, and characterization of new materials from natural waste sources – plants or fly ash from coal combustion – to be used for Cu(II) sorption or as geopolymers for various applications, are described in two other papers. These are followed by five studies dealing with metals, although from very different perspectives – biochemical effects of Pt(II) ions on reactivation of acetylcholinesterase activity or spectroscopic investigation on the Fe(III) complexation with a polyether antibiotic, followed by two structural studies on Pt(II) and Pt(IV) complexes that employ various spectroscopies and are complemented by either quantum chemical or crystallographic methods to conclude with the crystal structure description of binary rare-earth metal germanides. In the following two papers, rare-earth and alkaline metals were quantified in different soils by gamma-spectrometric determination of the corresponding radionuclide ( $^{152}\text{Eu}$  or  $^{137}\text{Cs}$ ). Further on, the structure and thermal properties of ebony wood were tested upon gamma radiation, whereas the collection of 40 monofloral bee honeys from Bulgaria was the subject of detailed physicochemical and bioanalytical characterization. The illustrated

diversity of studied objects concludes with the application of the non-destructive X-ray fluorescence for authenticity evaluation of archeological findings (e.g. silver coins) or some original paintings of Dimitar Dobrovich as part of the national cultural heritage.

With the topics addressed in this collection of works, we could touch upon the scientific fields traditionally developed in our Department, which span from Spectrometric Elemental Analysis, Radiochemistry, Archaeometry, Chemometrics and Molecular spectroscopy to Bioanalytical and Biocoordination chemistry. We believe that the presented studies will equally inspire future developments and collaborations as well as critical analysis of the current state of research quality and diversity for the prosperity of the Analytical Chemistry Department at Sofia University.

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