

Preface to the Second Edition

The publication in 2008 of our review paper ‘Green Analytical Chemistry’ in *Trends in Analytical Chemistry* was motivated by the fact that, at that time, many authors had rediscovered the previously called clean analytical or environmentally friendly methods. Hence, based on the international success of the green chemistry paradigm, proposed by Paul Anastas, it was necessary to redefine the objectives and practices involved in this sustainable and environmentally friendly analytical chemistry movement. The review was well accepted by the analytical community (so far it has received more than 620 citations, as indicated in Google Academics) and has attracted the attention of major publishers such as Elsevier, the Royal Society of Chemistry and John Wiley & Sons.

Our research team accepted the invitations of these prestigious publishers to produce three books on the subject of *green analytical chemistry* and in 2011 our authored book was published by Elsevier, followed also in 2011 by the first edition of this book edited by us and published by the Royal Society of Chemistry, and a further edited book published by Wiley in 2012, moving from a personal discussion of the objectives and tools of green analytical chemistry to extended contents regarding different fields of application and, most important, taking into account the points of view of other research teams in our country and others.

However, it must be acknowledged that the first book to be published on green analytical chemistry was that written by Mihkel Koel and Mihkel Kaljurand, of Tallin University of Technology, Estonia. At the time when we were working on the books for Elsevier and the Royal Society of Chemistry, we discovered that these authors were writing their own textbook. This was not at all an unexpected situation in science in the twenty-first century and there were reasons to expect that other active research teams, such as that led by Professor Jacek Namieśnik, of Gdansk University of Technology, and

the group of Professor Farid Chemat, at the Université d'Avignon, could also write a book on the same subject, owing to their active research in the field. Many researchers do not feel comfortable sharing their field of application and discovering that other authors have published a book in their field before them. Obviously, this was not so in our case, and we found in Mihkel and Mihkel, and also in Farid and Jacek and his co-workers, such as Marek Tobiszewski and Justyna Płotka-Wasyłka, excellent friends and good collaborators in many of our editorial and research activities. Thus once again the active workers in green analytical chemistry decided to continue to work together and contribute to the extension of their research from basic and applied perspectives.

Eleven years after the publication of our review and eight years after the publication of the book by Koel and Kaljurand, a new book has been published concerning green laboratory practices by Arabinda Das, a new book edited by Justyna and Jacek has been published by Springer, the Royal Society of Chemistry has published a new edition of the Mihkels' pioneering book and Dunod published Farid Chemat's new book on green extraction, *Éco-extraction du Végétal*. All this provides clear evidence that the field of green analytical chemistry is very much alive and the dynamic of developing sustainable methods has been spread all around the world, and every year new colleagues join the research on the principles of green analytical chemistry and contribute to enlarging our knowledge of the sustainable perspectives of analytical methods.

The present book is an update of our previous edition of *Challenges in Green Analytical Chemistry*. Taking into account the advances in this field in recent years, we chose to look at a number of new topics that have emerged and incorporate new researchers' voices. Hence the reader will have the opportunity to find new authors, such as Jacek Namieśnik's group, Farid Chemat, Yukihiro Ozaki and Manel del Valle, and new subjects such as chemometrics, sensors and green solvents. Thus we have made great efforts to provide the reader with as complete as possible picture of the tools available today for greening analytical methods.

The reasons for continuing our efforts in green analytical chemistry come from the facts that this emerging field of research has been highly productive in creating new ideas and tools and that the social movement, concerning the third industrial revolution and the deleterious effects of climate change, encourages researchers to look for sustainable tools in all fields. Additionally, as Jacek suggested in one of his recent papers, green analytical chemistry is also important in providing an equitable chemistry that could widen the benefits of analytical methods to developing countries and, as evidenced by our own publications in the clinical field, move in the direction of a democratic analytical chemistry.

Finally, we would like to dedicate this new book to the memory of Jacek Namieśnik, a great scientist and close friend who contributed to enlarging the horizon of green analytical chemistry from both sides, theoretical development and the incorporation of new tools for greening laboratory

practices. We have lost a friend and one of the most prominent scientists in the field. However, we are happy that his work will be continued by the generation of analytical chemists that he encouraged to move in the green direction and thus Jacek will always remain in our minds.

*Salvador Garrigues
Miguel de la Guardia*