Nicholas Snow (Ed.): Basic multidimensional gas chromatography
Miguel Herrero

Book's topic Chromatography has become one of the most used tools in analytical chemistry today. Its suitability for the separation of components in complex mixtures has significantly contributed to the advancement of Science in so many research fields. With more than one century of evolution, lots of technical and methodological improvements, with several Nobel Prizes awarded as a result, have meant that the capabilities of chromatographic methods have increased dramatically. An important group of developments is based on the coupling of at least two separation processes to generate multidimensional approaches. In the particular case of gas chromatography (GC), the development of multidimensional procedures has increased the total peak capacity and resolving power attainable making possible the direct analysis of complex samples that seemed unattainable some decades ago. Although notable heart-cut GC applications have been presented, the application of comprehensive two-dimensional GC (GC $\times$ GC) is undoubtedly the major breakthrough in the field of multidimensional chromatography. Although most important leaps forward in the evolution of GC $\times$ GC are related to developments on modulation instrumentation and procedures, improvements on column technology and data analysis have strongly contributed to establishing GC $\times$ GC as a mature technique in the field of chromatography. The book Basic multidimensional gas chromatography edited by Nicholas H. Snow provides a broad overview covering the fundamental principles involved in the development and application of multidimensional GC. Written by renowned experts in the field, important topics related to theoretical and practical aspects are presented described in detail.

Contents The book is structured into 8 chapters for a total of 309 pages. Each particular chapter is centered on a specific part of a multidimensional procedure, with two additional introductory chapters revealing the historical background of GC $\times$ GC as well as the evolution from single-dimension to multidimensional GC. This way, the core of the book is composed of monographic chapters covering the most relevant features of column configuration and technology applied to multidimensional GC, modulators, inlets and samplings, detectors and basic data handling, advanced data handling applied to GC $\times$ GC, and a review of the most notable applications developed so far. Moreover, an appendix includes interesting information for further reading and resources. The aspects described in the text are perfectly illustrated by color highquality figures and tables that are essential to enhance the readability of the text and to help the reader to perfectly understand the different technologies used as well as the effect of diverse parameters on the technique development.

Comparison with the existing literature Several books can already be found dealing with multidimensional gas chromatography following a general overview related in part with the present book. Notable examples include Multidimensional chromatography edited by Mondello, Lewis, and Bartle (Wiley, 2002). This book deals with different aspects related to multidimensional GC, although it also includes other multidimensional chromatography couplings. Another previous book on the same topic is Multidimensional chromatography, techniques and applications by Cortes (CRC Press, 1989). Lastly, the volume Comprehensive two dimensional gas chromatography by Ramos (Elsevier, 2009, 1st Ed.) describes the most important aspects related to GC $\times$ GC. Thus, the present book differences itself from the existing literature presenting a general overview of multidimensional GC, not limited to particular couplings, and showing updated information in a field that has significantly evolved in the last years.

Critical assessment The material presented in this book is therefore excellent to acquire a general knowledge of the basics, instrumentation, requirements, and applications of the different multidimensional gas chromatography couplings. The updated information included in the book will be of utmost interest to those already working with these techniques or willing to work in this challenging field.

Readership recommendation The book is primarily directed to scientists and Ph.D. students working with gas chromatography. It provides relevant information, from a general background to more in deep details, to be able to get into multidimensional gas chromatography practice, acquiring strong knowledge that will help to successfully implement those approaches in their regular lab work.

Summary The present book shows an updated overview of the current advancements on multidimensional gas chromatography theory, instrumentation, and application, providing also a historical background extremely useful to perfectly understand how this technique has evolved in the last decades. Specific chapters are devoted to each important part of a multidimensional instrument showing in detail the more relevant information. Moreover, data acquisition and handling, always critical to get the most out of a multidimensional separation procedure, are also explained. In general, the book presents interesting and complete information on this topic to acquire the needed fundamental knowledge to get started with the practice of multidimensional gas chromatography as well as to deepen to more advanced concepts in the way to master this technique.