Polish J. Chem., **75**, 919 (2001) **BOOK REVIEW**

Solid-phase extraction. **Principles, Techniques and Applications. Edited by Nigel J.S. Simpson**. Marcel Dekker, Inc., New York 2000, pp. 514, ISBN 0-824-0021-X.

This book summarises the developments for solid-phase extraction (SPE), the technique which is now widely used in sample preparation step. It changed the names together with the increase in popularity and the advance in sorbent types and products formats. In the early 1980s the terms "adsorption trapping" or "extraction chromatography" were commonly applied. Sine the commercially available prepacked devices were introduced, the description as solid-phase extraction is the most popular used term. SPE is one of various techniques available to an analyst to bridge the gap between the sample collection and the analysis step. Filtration, homogenisation, precipitation, chemical reaction, solvent exchange, preconcentration, matrix removal – these are just a few of the possible tools that may be used individually or in combination to get the sample into a form compatible with the analytical method.

The first part of this book describes the basic steps of SPE – it means the current theory and models, main techniques and practices over a wide range of the analytes, sample types and extraction mechanisms. Particular attention is paid to the effects of the sample matrix upon the choice of extraction mechanism and the resulting application. The authors tried to demonstrate extractions on the most common sample types such as environmental matrices (water, air, soil, sludge), biological fluids (urine, plasma, serum, whole blood), food and beverages, plant, pharmaceutical and herbal preparations, wastes and industrial materials. Separate chapter deals with the sorbent characterisation. Under this topic were included adsorption isotherms, chromatographic characterisation, particle properties, nature of solid surface, chemical stability and cleanliness. The important aspects of solvent choice and their properties were presented in the next chapter. As solvents are required in all major processing step in SPE, their quality and performance characteristics are vitally important in achieving success in this technique. The entire solid-phase extraction devices, defined as filters, frits, containers and sorbents, were then considered. The issue of column efficiency versus resolving power and capacity was discussed, following from the use of the liquid chromatography phenomena to explain certain processes in SPE.

The second part of the book presents the application of SPE technique to environmental matrices, broad-spectrum drug screening in toxicological analysis and veterinary drug abuse. The preparation of biological samples for further analysis in clinical chemistry, forensic science and biomedical and pharmaceutical research is also presented. As the sample preparation step is the rate-limiting step for many analysis, one chapter has focused on the benefits and problems connected with automation of SPE application, starting with the evaluation process, through the review of current workstation principles and capabilities, to the automation of method development.

The approaches to connecting solid-phase extraction technique to HPLC or LC/MS interfaces were described in the next chapters. Finally, the coupling of SPE to a variety of analytical methods such as gas chromatography, absorption spectrometry, UV-VIS spectroscopy, electrophoresis, NMR and electrochemical measurements is discussed. In some cases application of solid-phase extraction involves more than only preconcentration of an analyte and its separation from matrix components. Sample extraction may be performed also „on the field" and final analysis may be carried out several days latter, in an entirely different location, because of the stabilising effect on the analytes due to their removal from the aqueous sample matrix.

The general opinion about this book is very positive. The reader can find the current SPE techniques and applications. The book, unlike other composed of chapters written by different authors, contains handy subject index. Certain data and supporting informations have been relegated to very useful appendix. Thus, you could find a list of current suppliers of solid-phase automation equipment.

K. Pyrzyńska