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Modern Advances in Chromatography

Volume Editor: Ruth Freitag

With contributions by
R. W. Allington, M. Barut, O. Brüggemann, J. M. J. Fréchet,
S. Imamoglu, R. Necina, A. Podgornik, A. Prior,
A. Strancar, F. Svec, T. B. Tennikova, J. Wolfgang, S. Xie

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Managing Editor

Professor Dr. T. Scheper
Institute of Technical Chemistry
University of Hannover
Callinstraße 3
30167 Hannover, Germany
E-mail: scheper@mbox.iftc.uni-hannover.de

Volume Editor

Prof. Dr. Ruth Freitag

Ecole Polytechnique Fédérale Lausanne
Laboratoire de Biotechnologie Chimique
Institut de Sciences des Procédés Chimiques et Biologiques
Faculté des Sciences de Base
1015 Lausanne, Switzerland
E-mail: ruth.freitag@epfl.ch

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Preface

Due to their versatility and resolution, chromatographic separations of complex mixtures of biologicals are used for many purposes in academia and industry. If anything, recent developments in the life sciences have increased the interest and need for chromatography be it for quality control, proteomics or the downstream processing of the high value products of modern biotechnology. However, the many "challenges" of present day chromatography and especially of the HPLC of biomacromolecules such as proteins, are also present in the mind of any practitioner. In fact, some of these latter were such hindrances that much research was necessary in order to overcome and circumvent them. This book introduces the reader to some of the recently proposed solutions. Capillary electrochromatography (CEC), for example, the latest and most promising branch of analytical chromatography, is still hindered from finding broader application by difficulties related to something as simple as the packing of a suitable column. The latest solutions for this but also the state of art of CEC in general are discussed in the chapter written by Frantisek Svec. The difficulty of combining speed, resolution and capacity when using the classical porous bead type stationary phases has even been called the "dilemma of protein chromatography". Much progress has been made in this area by the advent of monolithic and related continuous stationary phases. The complex nature of many of the samples to be analyzed and separated in biochromatography often requires the use of some highly specific ("affinity") ligands. Since they can be raised in a specific manner to many bioproducts, protein ligands such as antibodies have allowed some very selective solutions in the past. However, they also are known to have some disadvantages, including the immunogenicity (toxicity) of ligands contaminating the final products, or the low stability of such ligands, which prevents repeated usage of the expensive columns. This challenge may be overcome by "molecular imprinting", a techniques, which uses purely chemical means to create the "affinity" interaction. Finally we were most happy to have two authors from industry join us to report on their experience with chromatography as a continuous preparative process. Readers from various fields thus will find new ideas and approaches to typical separation problems in this volume. Finally, I would like to thank all the authors for their contributions and their cooperation throughout the last year.

Lausanne, April 2002 Ruth Freitag

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