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Ionic Liquids in Analytical Chemistry, Edited by Dr. Mihkel Koel

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THE BOOK CORNER

IONIC LIQUIDS IN ANALYTICAL CHEMISTRY, Edited by Dr. Mihkel Koel, CRC Press, Boca Raton, Florida

An ionic liquid is a salt-like material that forms stable liquids below 100°C. The entities comprising an ionic liquid are predominantly ions and ion-pairs. Ionic liquids are miscible with water or organic solvents. Ionic liquids, known as liquid electrolytes, ionic melts, ionic fluids, fused salts, liquid salts, or ionic glasses, is a term generally used to refer to salts that form stable liquids. These liquid salts are of particular interest due to their extremely low-saturated vapor pressures. This characteristic has substantial scientific and commercial implications. They can be used as solvents, separation media, electrolytes, and lubricants. The term “ionic liquid” was introduced by R. M. Barrer in 1943 “*The Viscosity of Pure Liquids. II. Polymerised Ionic Melts.*” *Trans. Faraday Soc.* 39: 59–67. Ionic liquids are environmentally friendly (green chemistry) due to their non-volatility, which makes them useful as solvents for working in both high temperature and high vacuum. They have good solvating properties with broad spectral transparency, making them suitable for spectroscopic measurements.

Ionic Liquids in Analytical Chemistry introduces the reader to the application of these liquids. “The book is an attempt to collect experience and knowledge about the use of ILs in different areas of analytical chemistry such as separation science, spectroscopy, and mass spectrometry that could lead others to new ideas and discoveries.”

The book is well written by experts in these areas of research. As the Table of Contents shows, the book discusses different interesting and useful analytical applications. After a brief foreword and an introduction, the book gives a general review of ionic liquids, which is an enjoyable and beneficial reading (Chapter 1). The experimental and theory of ILs is discussed in detail in Chapter 2. Chapters 3–10 discuss different applications. Chapters 11–14 deal with application of ILs in NMR, mass spectrometry, Raman spectroscopy, and molecular spectroscopy. The book ends with a discussion of future prospects.

The book is recommended for all analytical chemists. It is an important topic that is worth investing some time in understanding its uses. This book does just that.

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ADVANCES IN CHROMATOGRAPHY,
 Volume 47, Eli Grushka and Nelu Grinberg, Eds. CRC Press,
 Boca Raton, Florida

This volume of the *Advances in Chromatography* series is a welcome addition to the chromatographer's library and any person interested in advances in separation science.

Historically, the series introduced the reader to the most up-to-date information on a wide range of developments in chromatographic applications, and presented novel topics in various research areas. The present

volume is no different in quality than the previous volumes and covers recombinant proteins and proteomics, mass spectrometry, HPLC separations, DNA sequencing, and oligonucleotide analysis, as well as capillary electrochromatography, ion exchange, thin layer chromatography, and simulated moving bed processes.

The current volume is divided into ten chapters totaling 453 pages. Chapters 1 and 2 deal with the use of mass spectrometry in proteomic research, an important topic which has gained many researchers in the last decade as a result of advances in mass spectrometric instrumentation (ESI, MALDI, TOF). Chapter 3 is a discussion of the role of electrophoretic methods in DNA and oligonucleotide analysis.

Chapters 4 and 6 deal with two interesting topics: mixed-mode phases for capillary electrochromatography and resins for ion exchange chromatography. Chapter 5 discusses the principles and applications of simulated moving bed processes, a technique that has gained momentum in the last decade. Carbohydrates play an important role in different biological systems. Electrochemical detection of carbohydrates is discussed in detail in Chapter 7.

Derivatization of compounds is an important aspect of detection and separation in gas, liquid, thin layer, and electrochromatography. Since not all compounds ionize to the same degree in the mass spectrometer, derivatization with an ionizable moiety increases the sensitivity considerably. Compounds that are not volatile are made volatile by derivatization, compounds with no chromophore or fluorophore are made to absorb and fluoresce by derivatization, etc. Chapter 8 is a discussion of derivatization for drug assaying. Countercurrent chromatography and its applications are discussed in Chapter 9. The final chapter deals with hyphenated techniques in thin layer chromatography. One wonders what does that mean and how a mass spectrometer is connected on-line to a TLC plate. One needs, then, to read Chapter 10.

Two typographical errors were found; Chapter 3, oligonucleotide should be oligonucleotides, and Chapter 4, phase should read phases.

Overall, the chapters are well written by experts in their areas of research. References are up-to-date and the illustrations are easy to understand.

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