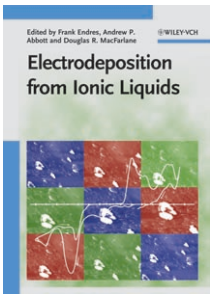
Electrodeposition from Ionic Liquids



Edited by *Frank Endres*, *Andrew P. Abbott*, and *Douglas R. MacFarlane*. Wiley-VCH, Weinheim 2008. 288 pp., hardcover € 139.00.—ISBN 978-3-527-31565-9

With all the excitement that has surrounded the use of ionic liquids as process solvents for the synthesis of organic chemicals, it is easy to forget that the main purpose of the early development of ionic liquids was for use as low-temperature liquid electrolytes. It is equally easy to forget the commercial importance of the electrodeposition of metals from molten salts. This book makes neither of these mistakes, but rather puts the two together to provide a powerful rationale for the investigation of the advantages that may be won by the use of ionic liquids and other closely related solvent systems in electrodeposition. These range from more convenient operating conditions to subtle control of the morphology of the deposit.

The editors are very well placed to undertake their task. Between the three of them they have a range of experience of the use of ionic liquids for electrodeposition that extends from the highly academic through to commercial application. They have gathered together an impressive line-up of contributors, all of whom have provided readable chapters.

After the introductory parts, the book continues with a section on making ionic liquids and deep eutectic solvents, which is very brief and largely refers the reader on to more detailed accounts elsewhere. It then moves on to give an excellent introduction to those physical properties of ionic liquids that are of direct relevance to electrochemical applications. The majority of the chapters are about electrodeposition itself. Four are organized according to the types of materials being deposited—metals, alloys, semiconductors, and conducting polymers. It is good to see that the latter were included. These are followed by two chapters on the subject of the deposition of nanomaterials and their analysis by scanning tunneling microscopy (STM). The later parts of the book are a very useful series of guides to technical aspects and to the methods by which results have been achieved, with helpful comments and advice. The book ends with suggestions regarding some future challenges and areas for further study, and finally a plea for closer collaboration between those who concentrate on synthesis and those who make physical measurements.

So now, on to my likes and dislikes. The book is well structured and indexed, and it is easy to quickly find the information that one is looking for. Its great strength is that it is very practical in its approach, and I am sure that an electrochemist new to working with ionic liquids would find it a mine of useful information and advice. I particularly like the fact that it does not shy away from difficulties that can be encountered when working with ionic liquids, and I found myself with a wry smile when I first came across the section entitled "Troublesome Aspects". Chapter 11, on "Technical Aspects", can be singled out for particular praise. My only real irritation with the book was that several different abbreviations were used for the same material. This is even pointed out in the Foreword. When editing a book with many contributors, it can be difficult to decide where to draw the line between speaking with the voice of the contributor or that of the editor. In this case, the reader's need for clarity should have been placed first. The inconsistencies could have been corrected so simply and quickly with a search-and-replace routine, and that should have been done.

This book will be a useful introduction to the use of ionic liquids for all those who are interested in electrodeposition, from research students to professors, and I recommend it to them. It forms a valuable complement to two other successful texts from Wiley-VCH on ionic liquids, without unnecessary repetition of material.

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