

Electrodeposition from ionic liquids. F. Endres, A. P. Abbott, and D. R. MacFarlane (Eds). WILEY-VCH, Weinheim, 2008

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A few years ago, the term ionic liquids simply did not exist—only room-temperature molten salts could attract the interest of some specialists. Because most of the respective compounds were based on AlCl_3 , handling these salts was hardly an attractive perspective promising reproducible and easy experiments. Thus, the change in terminology was very appropriate and helpful to separate a now blooming field of science from this rather nasty impression. Among the many fascinating and promising aspects of ionic liquids electroplating (or more generally when depositing non-metals: electrodeposition) is a particularly interesting area of research and development. In recent years, the development has reached a state justifying a collection of contributions dedicated to various aspects of this topic ranging from fundamental and general to specific recipe-like ones. And—despite the claims of the editors—the area appears to be a field still plowed by only few activists: the names of the editors appear somehow in the titles of most of the 13 chapters. This somewhat unusual feature mediates a major problem of edited books: connectivity between chapters. Remarks like the statement on p. 119 regarding recycling of ionic liquid treated later in ch. 11.4 would be highly unlikely in the standard format of books composed by an editor of only loosely connected contributions.

Some background and motivation is provided in the brief first chapter. Synthesis of ionic liquids including eutectic-based ones (in this section, finally, deep eutectics appear) is treated in the second chapter. Physical and chemical, in particular electrochemical properties are subjects in chapter three. The remainder of the book is dedicated to deposition

of: metals (ch. 4), alloys (ch. 5), semiconductors (ch. 6), conducting polymers (ch. 7, obviously intrinsically conducting ones), nanostructured metals and alloys (ch. 8), and nanostructures with a scanning tunneling microscope (ch. 9). Plasma electrochemistry with ionic liquids is the topic of ch. 10, technical aspects and plating protocols are collected in ch. 11 and 12. Future directions are outlined in the final chapter 13. The chapters are carefully organized; description of a given deposit, its preparation and its properties is very systematic. Because the editors are apparently engaged in many aspects of the books topic it is not surprising to notice, that they have added critical remarks regarding reliability and reproducibility of results in case of dubious (from their point of view) primary reports. Although this may be somewhat unusual, it is certainly helpful for readers planning their own entrance into the field. The very practical information provided in ch. 11 will help every novice entering the field.

The book has been prepared carefully, in case of quite a few figures, strange composites of scanned figures with added labeling has been applied resulting in loss of details sometimes. Fig. 11.22 contains quite a few waves and peaks—but even more are discussed in the text, some labels have apparently been lost. Changing the type of display of cyclic voltammograms between the correct current one and the historical polarographic one even inside a chapter is simply confusing and should be avoided. Fig. 8.10 and 9.5 are apparently the same. Typing errors are rare, when they occur they tend to amuse: poly(analine) on p. 169. The liberal use of conductivity and specific conductivity (e.g., p. 22 and 26) reveals a certain nonchalance—the latter term is correctly conductance. A fundamental problem overlooked by the authors and editors presumably too deeply absorbed with their subject: Nowhere a systematic and complete list of the myriad acronyms of the ions making up ionic liquids

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and their structural formulas is provided. The fact that many ions come disguised with various acronyms (as justifiably deplored in a discussion by one of the editors), does not help to alleviate the situation—it makes it only worse. At least this problem is addressed in a short (and unfortunately incomplete) list close to the start of the book (with the meaning of the square brackets kept a mystery and with many names not in agreement with standard nomenclature), effective help seems to be unavailable—as the reviewer has learned the hard way himself when collecting data from further sources. In case of one apparently very popular

anion, six acronyms are listed—with the added remark that sometimes three other names might also be used. What a nice understatement. A list of symbols is missing, and the result is a mess. The reviewer finally stopped counting the different symbols used to designate (whatever) conductivity. Nevertheless, this book is certainly a must for every research library of an institution somehow involved with electrochemistry and unconventional chemical synthesis.

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