G. G. Láng and Cesar A. Barbero: Laser techniques for the study of electrode processes

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This is a well-written book, excelling in the rigor of presentation and in detailed reference lists at the end of each chapter, for the convenience and extended study of each subject discussed.

It starts with the thermodynamics of interfaces. This would seem to be a mundane subject, well described in most textbook and many series in electrochemistry. However, emphasis is placed here on the solid–liquid interface, taking into account the mechanical stress and strain of the solid (which is totally ignored in “Electrocapillary Thermodynamics,” which applies implicitly to mercury (and other liquid electrodes)). Chapters 2 and 3 deal with a highly accurate derivation of the relevant equations and settle several inaccuracies commonly occurring in the literature. It is not easy reading, but highly valuable for the people doing research and making careful experiments in this field.

Chapters 4 and 5 contain detailed explanation of the different experimental techniques that can be used when studying the solid metal/electrolyte interface. The equations needed to interpret the experimental results and the limitations (and possible artifacts that could compromise the conclusions derived) are very well explained. Optical methods for studying the bending of the surface are described in detail in Chapter 5. This is where the use of laser beams comes in (although regular light sources collimated by lenses, mirrors, and apertures could in principle be used, if less conveniently). It must be admitted that some of the figures (for example, nos. 14 and 15) are rather complicated, and not sufficiently explained). Section 5.2.9 on page 108, regarding the QCMB, seems to be out of place. It is too short to explain the shortcomings of this technique, certainly not at the high level of the other optical and mechanical method discussed in this book (e.g., the fact that the change of resonance frequency is rarely a linear function of the mass added).

Chapter 6 on STM and AFM suffers also from the same weakness as that of Section 5.2.9. Allocating only four pages to these two important techniques is also below the high level of the rest of the book. In my opinion it could be either deleted or discussed in detail, with all the advantages and limitations of interpretation of the data.

Chapter 7 is fine, although rather limited in range, and it is not clear why these specific examples were chosen.

Chapter 8 is a nice addition to the book. Here we see again the rigor of the book. The equations shown are used a lot in thermodynamics, and it is nice to see them derived carefully in one chapter of the book.

The material given in the rest of the book is rather outside the range of my expertise, so I shall not comment on it. Nevertheless, scanning through the pages does seem to show the pedantic approach of the authors and the rather detailed treatment of the different subjects, which is the strength of this book.

Concluding this review, it must be said that this book is of very high scientific value, which can be used by people doing research in this field. It is by no means easy to read, but the effort of reading it, or at least certain parts of it, could be highly worthwhile. Thus, the book can be highly recommended. I think that the title is somewhat misleading. Admittedly, lasers are the best light sources to be used in some (but not in all) of the experiments discussed, but even when lasers are used, they are not essential. They could be replaced by highly collimated light beams, as noted above.

I do not understand the need to define an electrode. *Everybody doing electrochemistry knows what an electrode is.* Defining it, so that it would include not only a metal and an electrolyte, but also some esoteric combination (e.g., of mixed electronic and ionic conductors), does not add to the physical understanding of electrochemistry. However, this is my own view, and those sharing my view could skip the two or three pages dealing with this, without hurting the high quality of the book.

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