Electrochemical Dictionary by Allen J. Bard, György Inzelt, Fritz Scholz (eds)

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With the first edition of the Electrochemical Dictionary, the editors presented a comprehensive manual where the readers of electrochemical literature could find explanations/definitions of scientific terms. How opportune it was to prepare such dictionary, an effort of almost a hundred active researchers, is clearly reflected in the fact that only 4 years later, a second edition, completely revised and extended, could be launched. In the second edition, the number of *lemmata* has been extended from 2,770 to 3,138 (among which are 826 cross references and 2,312 full entries), the number of figures has been increased from 469 to 583 and the number of pages has been increased from 723 to 991. These numbers reveal the magnitude of the task, undertaken by 100 authors. The reader finds a text that maintains the scope and general structure of the first edition, while being clearly extended in various ways.

This revised edition provides an extended coverage of electrochemical terms, in particular in the fields of electrochemical energy conversion and bioelectricity, but still maintaining a very wide coverage of all aspects of electrochemistry. Thus, several entries have been significantly extended, often including new sub-entries: this is the case of alloy deposition, now including thermodynamics and kinetics of electrochemical nucleation of alloy clusters, but also those on electron exchange reaction, electronic coupling, redox catalyst, among others. The inclusion of new entries is directed, in most cases by reasons of operational

usefulness. Thus, terms such as quasireversible maximum, Cole–Cole equation diagrams or onset potential, frequently used in electrochemistry literature, have been included in this second edition and frequently supported by illustrative figures. This is of particular value for students and chemists entering electrochemistry for the first time to, but also for technicians and researchers working in a given electrochemical field who need to utilize other electrochemical techniques. The number of entries devoted to generic concepts (bioimpedance), materials (grapheme, quantum dots), devices (Harned cell), and phenomena (Hall effect) has also been significantly increased.

Another remarkable aspect of the Electrochemical Dictionary is its coverage of the history of electrochemistry. Following the general line of the entire dictionary, the number of historical topics (for instance, d'Arsonval galvanometer) and biographic entries has been increased (adding, for instance, Bode, Cole, Cremer, Doss, D. C. Graham, Hodgkin, Jungner, Karaoglanoff, Kolb, Kuznetsov, Neeb, Nikolsky, Nyquist, Ruben, Simon, Stern, Tower, Warburg, and Wien) and new graphic material (surely most of them difficult to find, e.g., the portraits of Classen or Nikolskij) has been added. The history of electrochemistry can be, although necessarily fragmented, reconstructed through such biographic entries so that electrochemists can find a condensed view of their historical roots.

Graphical support, either from published reports or ad hoc schemes, constitutes an interesting aspect of this dictionary, so that now 25 % of the entries are accompanied by illustrations. Accurately presented, as in the first edition, the second edition includes a number of additional figures, mostly in the new entries (electrode ensemble, heated electrodes, nucleation, and growth kinetics), but also as

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additional figures in existing ones. In most cases, the size of existing figures has been varied relative to that in the first edition; in general enhanced (cyclic voltammetry, electrochemistry of respiration, digital filter, etc.) but in few cases decreased (chronoamperometry, polyaniline), although maintaining the clarity.

The dictionary maintains the pedagogical orientation which is one of its values, thus retaining terms which have become obsolete (such as hydrogen ion exponent) and those whose use is explicitly discouraged in the accompanying text (hydrogen overvoltage). This explicit critical view is one of the characteristics of this second edition, where several entries have been redirected accordingly: for instance, the text defining the point of zero charge entry in the first edition has been moved to the potential of zero charge entry, accompanying the pertinent crosslink between the two terms.

It is pertinent to underline that the Electrochemical Dictionary represents not merely a dictionary *sensu stricto*, where the meaning of “technical” terms is explained, but also a manual for approaching electrochemical science, with inclusion of detailed explanations of terms, aided in most cases by equations and graphics and providing representative references. The reader can find here an encyclopedic approach which

provides coverage of fundamentals of electrochemistry in the theoretical, practical, and applied aspects.

Under a flexible interpretation of the incommensurability view of science due to Feyerabend and Kuhn, a given scientific paradigm can be viewed as having ontological, semantic, operational, and also historical and epistemological dimensions [1, 2]. In this view, the current Electrochemical Dictionary is something more than a technical book, focused on the semantic dimension of electrochemistry, but also a “portrait of family” of the current views of electrochemical science, representative, ultimately, of all other aspects defining contemporary—and also its historical roots—electrochemistry. These characteristics make this Electrochemical Dictionary a highly recommendable book for all people working in research and practical applications of electrochemistry and/or interested in the knowledge of this scientific field.

References

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