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BOOK REVIEW

O. Hammerich, J. Ulstrup (Eds), Bioinorganic Electrochemistry

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The electrochemistry of bioinorganic systems, i.e., biochemical systems with prominent metal redox centers, attracts a lot of attention, and this is for two major reasons: One is the electrochemical nature of charge transfer processes in these systems (a fundamental aspect), and the other is the fact that electrochemical methods lend themselves for the study of these systems (a methodological aspect). The book "Bioinorganic Electrochemistry" is a collection of reviews authored by prominent specialists. The books starts with a chapter on "Electron tunneling through iron and copper proteins" written by J. R. Winkler, A. R. Dunn, C. R. Hess, and H. B. Gray. The authors cover the main developments in that field in the time span 1988 to 2005, and they did that it a very condensed way so that the reader should have some preliminary knowledge about electron tunneling and also about iron and copper proteins. The following chapter "The respiratory enzyme as an electrochemical energy transducer" by M. Wilkström is a didactically very well-written presentation, which will be highly useful even for beginners. The third chapter is entitled "Reconstituted redox proteins on surfaces for bioelectronic applications." B. Willner and I. Willner give a superb overview with a large number of well-prepared schemes and figures. This chapter will be equally beneficial for people working with biosensors, for those developing new bioelectronic devices, and for those interested in biofuel cells. In the fourth chapter, J. N. Butt and F. A. Armstrong discuss the "Voltammetry of adsorbed redox enzymes: Mechanisms in the potential dimension." The authors convey a lot of basics, which are essential for everybody performing voltammetric measurements with enzymes, and they are illustrating these basics with well-chosen examples. Chapter 5 is devoted to "Electrochemistry at the DNA/electrode interface: New approaches to nucleic acids biosensing." That chapter, written by M. G. Hill and S. O. Kelley, gives a good overview about the deoxyribonucleic acid-sensing approaches. Since the topic is very fashionable now, it is not surprising that the chapter competes with a number of similar reviews published elsewhere, which is no criticism at all. The last three chapters of the book, i.e., "Charge transport of solute oligonucleotides in metallic nanogaps—observations and some puzzles" (A. M. Kuznetsov, J. Ulstrup), "In situ studies of immobilized biomolecules at electrode–electrolyte interfaces" (R. J. Nichols, W. Haiss, D. G. Fernig, H. van Zalinge, D. J. Schiffrin, J. Ulstrup), and "Charge transfer and interfacial bioelectrochemistry at the nanoscale and single-molecule levels" (J. Zhang, T. Albrecht, Q. Chi, A. M. Kuznetsov, J. Ulstrup), distinguish themselves by the high theoretical level. The great advancements made in understanding charge transfer processes on a single molecular level, which were achieved by application of scanning probe techniques, are presented in a clear way, and the complex theoretical background is outlined in a way to draw the attention on the most important points that have to be considered in interpreting experimental findings.

The book "Bioinorganic Electrochemistry" will be of great value for the bio-community in electrochemistry and also for biochemists interested in charge transfer processes. However, I can also recommend it to anybody else who wants to be updated on the latest achievements in this area. The book is rather heterogeneous with respect to the level of treatment, and depth, and way of presentation. This is practically unavoidable for a multiauthor book. It is neither a textbook nor a monograph but a collection of reviews—and so, people will admire the authors' and editors' efforts to give a detailed account of charge transfer in bioelectrochemical systems.

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