

Bard–Stratmann

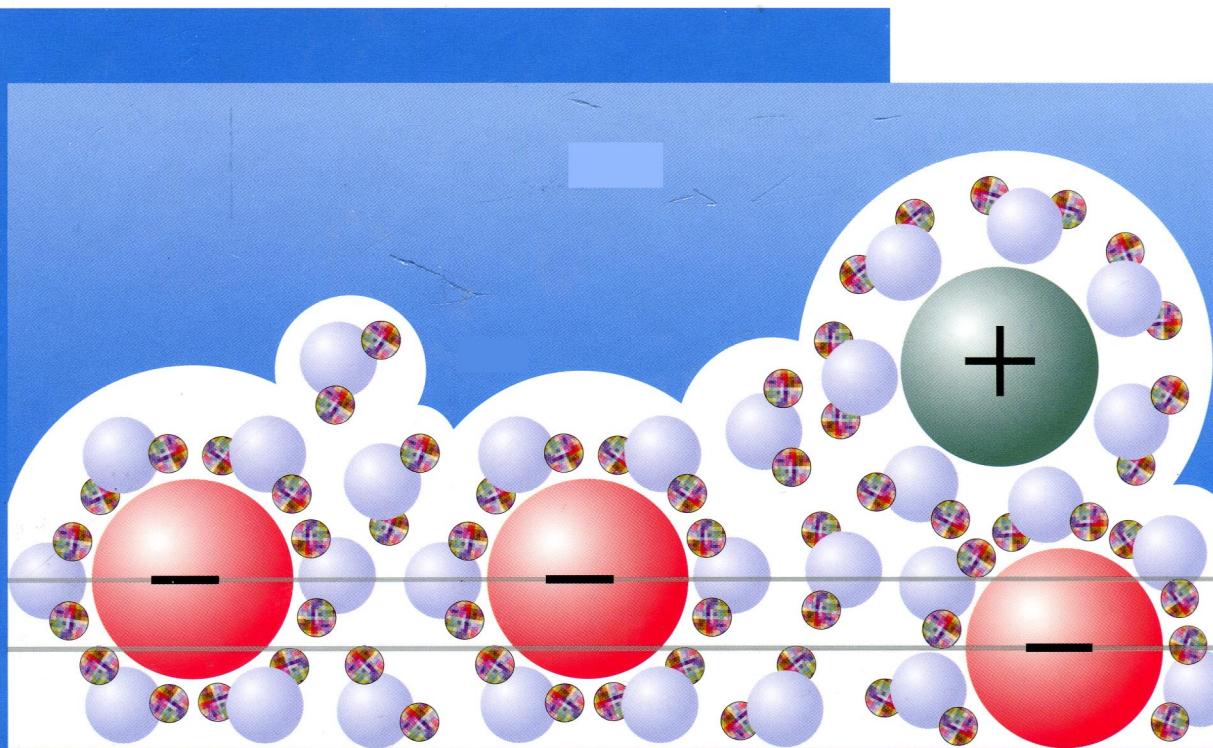
Encyclopedia of Electrochemistry

Volume 10

Modified Electrodes

Volume Editors:

Masamichi Fujihira, James F. Rusling,
Israel Rubinstein



++ + + + + + + + + + +



WILEY-VCH

Encyclopedia of Electrochemistry

Edited by A.J. Bard and M. Stratmann

Volume 10

Modified Electrodes

*Volume Edited by Masamichi Fujihira, Israel Rubinstein,
James F. Rusling*



WILEY-VCH Verlag GmbH & Co. KGaA

Editors:

Prof. Dr. Allen J. Bard

Department of Chemistry
University of Texas
Austin, TX 78712
USA

Prof. Dr. Martin Stratmann

Max-Planck-Institut
für Eisenforschung
Max-Planck-Str. 1
40237 Düsseldorf
Germany

Prof. Dr. Masamichi Fujihira

Department of Biomolecular Engineering
Tokyo Institute of Technology
B-56, 4259 Nagatsuta, Midori-ku
Yokohama 226-8501
Japan

Prof. Dr. Israel Rubinstein

Department of Materials and Interfaces
Weizmann Institute of Science
Rehovot 76100
Israel

Prof. Dr. James F. Rusling

Department of Chemistry, U-60 and
Department of Pharmacology (Health Center)
University of Connecticut
Storrs, CT 06269-3060
USA

COVER: Courtesy of Prof. Dr. D. M. Kolb,
University of Ulm, Germany

This book was carefully produced nevertheless, authors, editors, and publisher do not warrant the information contained therein to be free of errors. Readers are advised to keep in mind that statements, data illustrations, procedural details or other items may inadvertently be inaccurate.

Library of Congress Card No: applied for
British Library Cataloguing-in-Publication Data: A catalogue record for this book is available from the British Library.

Bibliographic information published by Die Deutsche Bibliothek Die Deutsche Bibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data is available in the Internet at <<http://dnb.ddb.de>>.

© 2007 WILEY-VCH Verlag GmbH & Co.
KGaA, Weinheim
All rights reserved (including those of translation into other languages). No part of this book may be reproduced in any form – nor transmitted or translated into machine language without written permission from the publishers. Registered names, trademark, etc. used in this book, even when not specifically marked as such are not to be considered unprotected by law.

Printed in the Federal Republic of Germany
Printed on acid-free paper.

Composition: Laserwords Private Ltd,
Chennai, India

Printing: betz-druck GmbH, Darmstadt

Bookbinding: Litges & Dopf Buchbinderei
mbH, Heppenheim

ISBN 978-3-527-30402-8

Contents

1 Preparation of Monolayer Modified Electrodes 5

Michael Brumbach, Neal R. Armstrong, Uichi Akiba, Masamichi Fujihira, Rolando Guidelli, Masaru Sakomura, Marcin Majda, Doug Knigge, Pushwinder Kaur, Greg M. Swain, Chimed Ganzorig, Marie Anne Schneeweiss, and Israel Rubinstein

2 Layer-by-layer Assemblies of Thin Films on Electrodes 373

Steven L. Suib, Naifei Hu, James F. Rusling and Merlin Bruening

3 Epitaxial Electrochemical Growth 397

Michael D. Ward

4 Organic Polymer Modified Electrodes 413

Susumu Kuwabata and Hiroshi Yoneyama

5 Other Films 427

Mary Elizabeth Williams, Joseph T. Hupp, Winnie Dong, Bruce Dunn, Alexander Vaskevich and Israel Rubinstein

6 Ex Situ Methods 493

Masamichi Fujihira, Hiroki Okui and Fuminobu Sato

7 In Situ Methods 509

Shen Ye, Kohei Uosaki, Katsuaki Shimazu, Kingo Itaya, Masamichi Fujihira and Takashi Kakiuchi

8 Electron Transfer 623

Harry O. Finklea

9 Charge Transport in Polymer-modified Electrodes 651

György Inzelt

Encyclopedia of Electrochemistry. Edited by A.J. Bard and M. Stratmann

Vol. 10 *Modified Electrodes.* Edited by M. Fujihira, I. Rubinstein, and J.F. Rusling

Copyright © 2007 Wiley-VCH Verlag GmbH & Co. KGaA, Weinheim. ISBN: 978-3-527-30402-8

- 10 Electrochemical Reactions on Modified Electrodes 685**
Nagao Kobayashi, Theodore Kuwana, Tetsuo Osa, Yoshitomo Kashiwagi, Bineta Keita and Louis Nadjo
- 11 Redox-active Dendrimers in Solution and as Films on Surfaces 729**
Kazutake Takada, Jonas I. Goldsmith, Stefan Bernhard and Héctor D. Abruna
- 12 Electrochemical Formation of Organic Thin Films 755**
Tetsuo Saji
- 13 Electron Transfer and Transport in Ordered Enzyme Layers 763**
Agnès Anne, Christian Bourdillon, Christophe Demaille, Jacques Moiroux and Jean-Michel Savéant
- Volume Index 815**