ORGANIC ELECTROCHEMISTRY

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FUNDAMENTALS, MODERN CONCEPTS, AND METHODS

Edited by

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Elsevier
Radarweg 29, PO Box 211, 1000 AE Amsterdam, Netherlands
125 London Wall, London EC2Y 5AS, United Kingdom
50 Hampshire Street, 5th Floor, Cambridge, MA 02139, United States

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ISBN: 978-0-443-33399-6

Publisher: Peter Llewellyn
Acquisitions Editor: Yashila Girdhar
Editorial Project Manager: Debarati Roy
Production Project Manager: Fizza Fathima
Cover Designer: Mark Rogers

Typeset by MPS Limited, Chennai, India

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Preface

This book describes the dynamic and rapidly advancing field of organic electrochemistry, covering many issues of this discipline, from fundamental aspects to some applications in several fields. Single and multielectron transfer processes are discussed. A great variety of systems are analyzed, from hydrocarbons with and without oxygen and nitrogen atoms, dyes, and heterocyclic compounds. This book also covers enantioselectivity, CO_2 electroreduction and organic electrosynthesis, MN4 macrocyclic complexes, electro-remediation and removal of organic pollutants, electrochemistry of pharmaceutical compounds, and more. These different features of organic electrochemistry are covered in 29 chapters and 15 "spots" briefly introducing advanced topics.

Antonio Doménech-Carbó
José H. Zagal

Introduction

This book describes the fundamental aspects involved in a contemporary view of organic electrochemistry, including a revision of the state-of-the-art concerning concepts and methodologies in this field.

This book has been prepared to combine the presentation of the core of contents centered on classical organic electrochemistry, that is, dealing with electrosynthesis and mechanistic aspects, with the incorporation of directly related expanding areas. Several of such areas (electroanalysis, electropolymerization, ionic liquids, supramolecular systems, and organic-inorganic hybrid materials) possess today a significant implementation in organic electrochemistry and several others, whose development is more recent, and are rapidly growing as fields of research and application. This is the case of bipolar electrochemistry, miniaturization, electrochemical degradation of pollutants, and electrical energy production and storage, all having in common the intersection between classical electrochemistry and important technical and social demands.

This book has been divided into 29 chapters where well-defined monographic matters are treated in attempting to fit into the book format rather than the "review" format. These "ordinary" chapters are often accompanied by "Spots" where a more specialized issue is concisely presented. The idea is to present several of the plethora of aspects (e.g., electrochemical deuteration, deep eutectic solvents, and molecular machinery) where organic electrochemistry is directly involved.

We wish to thank all authors, active researchers in different areas of organic electrochemistry, for their valuable contribution and the effort to condense contents that, in all cases, could involve extensive writing. We hope that the resulting book may illustrate to people working on organic chemistry the capabilities of electrochemical methods and the electrochemical community the enormous possibilities of expansion of their research field into organic chemistry. In particular, this book may serve to young graduates and researchers to develop new ideas and explore new areas of knowledge.

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