

PREFACE

This series covers recent advancements in electrocatalysis and electrochemistry and depicts prospects for their contribution into the present and future of the industrial world. It aims to illustrate the transition of electrochemical sciences from its beginnings as a solid chapter of physical chemistry (covering mainly electron transfer reactions, concepts of electrode potentials, and structure of electrical double layer), to the field in which electrochemical reactivity is shown as a unique chapter of heterogeneous catalysis; is supported by high-level theory; connects to other areas of science; and includes focus on electrode surface structure, reaction environment, and interfacial spectroscopy.

The scope of this series ranges from electrocatalysis (practice, theory, relevance to fuel cell science, and technology), to electrochemical charge transfer reactions, biocatalysis, and photoelectrochemistry. While individual volumes may appear quite diverse, the series promises updated and overall synergistic reports providing insights to help further our understanding of the properties of electrified solid/liquid systems. Readers of the series will also find strong reference to theoretical approaches for predicting electrocatalytic reactivity by such high-level theories as density functional theory. Beyond the theoretical perspective, further vehicles for growth are such significant topics such as energy storage, syntheses of catalytic materials via rational design, nanometer-scale technologies, prospects in electrosynthesis, new instrumentation, and surface modifications. In this context, the reader will notice that new methods being developed for one field may be readily adapted for application in another.

Electrochemistry and electrocatalysis have both benefited from numerous monographs and review articles due to their depth, complexity, and relevance to the practical world. The Wiley Series on Electrocatalysis and Electrochemistry is

dedicated to present the current activity by focusing each volume on a specific topic that is timely and promising in terms of its potential toward useful science and technology. The chapters in these volumes will also demonstrate the connection of electrochemistry to other disciplines beyond chemistry and chemical engineering, such as physics, quantum mechanics, surface science, and biology. The integral goal is to offer a broad-based analysis of the total development of the fields. The progress of the series will provide a global definition of what electrocatalysis and electrochemistry are now, and will contain projections about how these fields will further evolve in time. The purpose is twofold—to provide a modern reference for graduate instruction and for active researchers in the two disciplines, as well as to document that electrocatalysis and electrochemistry are dynamic fields that are expanding rapidly, and are likewise rapidly changing in their scientific profiles and potential.

Creation of each volume required the editor's involvement, vision, enthusiasm, and time. The Series Editor thanks each Volume Editor who graciously accepted his invitation. Special thanks go to Ms. Anita Lekhwani, the Series Acquisitions Editor, who extended the invitation to edit this series to me and has been a wonderful help in its assembling process.

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