



Handbook of Fuel Cells: Fundamentals, Technology, Applications

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This four volume set brings together for the first time in a single reference work the fundamentals, principles and the current state-of-the-art in fuel cells. Its publication reflects the increasing importance of and the rapidly growing rate of research into alternative, clean sources of energy.

With internationally renowned Editors, International Advisory Board members, and Contributors from academia and industry, it guides the reader from the foundations and fundamental principles through to the latest technology and cutting-edge applications, ensuring a logical, consistent approach to the subject.

The Handbook is divided into three main themes, covered in four volumes:

- Volume 1: "Fundamentals and Survey of Systems"
- Volume 2: "Fuel Cell Electrocatalysis"
- Volumes 3 and 4: "Fuel Cell Technology and Applications"

Volume 1, "Fundamentals and Survey of Systems", provides the necessary backg round information on fuel cells, including the fundamental principles such as the thermodyamics and kinetics of fuel cell reactions, mass and heat transfer in fuel cells, and an overview of the key principles of the most important types of fuel cell, and their related systems and applications.

Volume 2, "Fuel Cell Electrocatalysis", is concerned with the most important basic phenomenon of fuel cell electrodes, electrocatalysis. It includes an introduction to the topic, and a detailed account of the theory. A number of the key practical methods used to study this phenomenon are discussed, as are a number of the key surface reactions. Finally, a number of other related topics associated with energy conversion are discussed.

Volumes 3 and 4, "Fuel Cell Technology and Applications" open with an overview of a range of sustainable energy supplies for fuel cell development. The key issue of fuel storage is considered in detail, before a detailed discussion of the most important types of fuel cells and their applications is presented. Among these, polymer electrolyte membrane fuel cell systems, alkaline fuel cell modules and systems, phosphoric acid fuel cells, direct methanol fuel cells, molten carbonate fuel cells and solid oxide fuel cells are covered in depth. The use of fuel cells in a range of systems is then considered, including portable systems, propulsion systems and electric utility systems. In addition to domestic and industrial systems, use of fuel cells in such novel environments as the space shuttle and submarines is addressed. Finally, Volume 4 closes with a discussion of the future prospects of fuel cell systems.

Comprising approximately 170 articles by more than 200 contributors, "The Handbook of Fuel Cells: Fundamentals, Technology and Applications", will be an invaluable source of reference for all those working directly in this important and dynamic field, for electrochemists, and for scientists, engineers and policy-makers involved in the quest for clean and sustainable energy sources.

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