several other articles in this section that have more relevance to SOFCs compared to other fuel cell technologies. These include papers on oxygen ion conductors and, defect chemistry of ternary oxides. The former article essentially considers candidate materials for SOFC electrolytes. Yttria-stabilized zirconia (YSZ) is the traditional material of choice for this application (and still remains so) though the aforementioned need to lower SOFC operating temperatures has initiated the search for new oxide ion conductors with higher ionic conductivities than YSZ. The article presents the main candidates currently under investigation including doped ceria, lanthanum gallate and scandia stabilized zirconia (ScSZ). For each material a brief history of its development is presented in addition to current material issues (in particular chemical stability at cell operating temperatures) that require attention before these new electrolytes can be realistically utilized in "real-world" devices.

A separate paper on traditional and emerging battery technologies should probably have been incorporated into this publication though a section on fast ionic conductors does provide significant information on materials utilized in state-of-the-art lithium based batteries. The final article within the electrochemical energy conversion section considers solid-state electrochemical gas sensors for emission control. While such devices are not energy conversion devices the article is certainly relevant in that it details different types of solid state sensor aimed at increasing automotive fuel efficiency and decreasing exhaust pollutants, such as CO, C_xH_y, NO_x, SO_x and H_2S.

The final chapter in the book considers thermoelectrical and nuclear energy conversion. Thermoelectric materials are of considerable interest and can be utilized for the recovery of energy from waste heat (e.g. exhaust gases from automobiles and solid oxide fuel cells). The article predominantly considers the thermodynamics of thermoelectric devices, and conventional (e.g. Bi_2Te_3, PbTe and $Si_{1-x}Ge_x$) and emerging thermoelectric materials (layered cobalt oxides). The section on nuclear energy does not consider materials used in the production of nuclear energy but rather the production of hydrogen by nuclear energy via electrolysis and thermal decomposition processes. In terms of reduced environmentally harmful emissions hydrogen is the optimal fuel for use in fuel cell devices, and its use is expected to greatly contribute to the solution of the global warming issue. In fact one deficiency of this book is lack of an article on hydrogen production/storage technologies and materials.

Overall "*Materials for Energy Conversion Devices*" provides a detailed review of emerging technologies related to energy conversion. The articles present an honest and non-biased review of these technologies and adequately detail their shortcomings and the need for continued research and improved materials.

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Electrochemistry of Nucleic Acids and Proteins. Towards Electrochemical Sensors for Genomics and Proteomics, E. Palecek, F. Scheller, J. Wang (Eds.). Elsevier, Amsterdam (2005). 808 pp

This book reviews current research in the very interesting field of electrochemistry of nucleic acids and proteins. Identifying DNA as the code of life was a remarkable discovery and uncovering the structure of DNA was the key to understanding the role that DNA plays in the formation of life. Applications of dynamic electrochemistry methods in research on nucleic acids and proteins have greatly increased in recent years.The history of the electrochemical research of nucleic acids and proteins is presented. The first chapters deal with the electrochemical properties of nucleic acid components and nucleic acids using mercury, carbon and other electrode materials, methods to follow the adsorption of nucleic acids at a polarized water/mercury interface, adsorptive stripping voltammetry and DNA-modified electrodes, labelling of nucleic acids with electroactive markers, development of sensors for DNA damage, and DNA hybridization.

In the subsequent chapters the emphasis is on electrochemical DNA biosensors for DNA hybridization detection methodologies. The advent of nanotechnology, and the special properties of nanoparticles, nanotubes and nanowires, to develop nanomaterial-based electrochemical DNA hybridization detection strategies is described, in some cases combined with the use of magnetic beads. Sensors for screening toxicity based on films containing DNA and an enzyme are referred to. Ultrathin layer-by-layer films, of nanometer thickness, are assembled by electrostatic adsorption of alternately charged layers of DNA and polyelectrolytes including redox polymers, enzymes, proteins or synthetic polyions.

Electrochemical immunosensors for the specific and sensitive determination of proteins, mostly based on competitive or sandwich assay configuration in combination with enzyme-labelled or redox-labelled immunocomponents are presented. The major problems in the development of electrochemical protein chips are evaluated.

The adsorption patterns of two-dimensional films of self-assembled biomolecules, particularly based on single-crystal atomically planar electrode surfaces, oligonucleotides, amino acids, and proteins, is reviewed. The approach is from building blocks to more highly organized systems, i.e., from mononucleotides to DNA fragments, and from aminoacids to proteins, organized on single-crystal Au(1 1 1) surfaces.

The final part of the book describes protein electrochemical studies. The achievements regarding direct electron transfer between redox enzymes and electrodes are summarised with a special focus on haem- and copper-containing redox-enzymes. The importance of the electrode surface condition on direct electron transfer communication between redox enzymes and electrodes is pointed out and electrode modifications are evaluated. However, the focus is mainly on amperometric enzyme sensors and it would be very interesting to also have more contributions on the mechanisms of redox catalysis by complex multi-centred electron-transport enzymes and metalloproteins as well as on developments in dynamic electrochemical studies of adsorbed enzymes and their active sites. Redox reactions in proteins are complicated processes that are difficult to understand so that research into electron transfer reactions of proteins is pertinent.

An important development has been the realization that both nucleic acid and protein molecules can be adsorbed at the surface of electrodes in various ways, and this subject has been little addressed in this book. Surface chemistry gives information on the chemical properties of interfaces and how and why they behave in a certain way. The minimization of non-specific binding is essential in electrochemical studies of DNA and proteins on surfaces in order to exploit novel applications. The study of the structures and dynamics of nucleic acid and protein molecules adsorbed at the resulting interface, as well as efforts to explain and simulate the different forms of electrochemical response, is determinant in clarifying the nature of the interactions between electrodes and nucleic acids or proteins, providing essential insight for future development of the field.

As a whole, this book is a comprehensive overview of an area of scientific interest and current as well as past research, by the contributing authors of the chapters, on the topics covered.

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