

# Ionic Transport Processes

*in Electrochemistry and Membrane Science*

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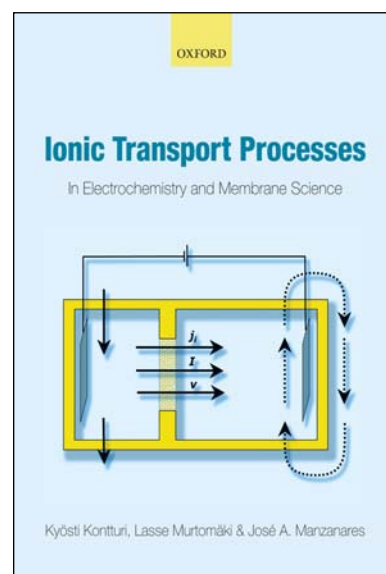
*“The main topic covered by this book, ionic transport, is of technological importance in relation to the current interest in membrane technology, for instance for developments in fuel cells. The complexity of these problems requires a fundamental approach and understanding of the basic processes taking place. The book is of very high quality and the inclusion of problem sets is a definite plus.”*

**David Schiffrin, University of Liverpool**

Modelling of heterogeneous processes, such as electrochemical reactions, extraction or ion-exchange, usually requires solving the transport problem associated to the process. Since the processes at the phase boundary are described by scalar quantities and transport quantities are vectors or tensors, coupling of them can take place only via conservation of mass, charge or momentum. In this book, transport of ionic species is addressed in a versatile manner, emphasizing the mutual coupling of fluxes in particular. Treatment is based on the formalism of irreversible thermodynamics, i.e. on linear (ionic) phenomenological equations, from which the most frequently used Nernst-Planck equation is derived. Limitations and assumptions made are thoroughly discussed.

The Nernst-Planck equation is applied to selected problems at the electrodes and in membranes. Mathematical derivations are presented in detail so that the reader can learn the methodology of solving transport problems. Each chapter contains a large number of exercises, some of them more demanding than others.

Turn over to order your copy



- Provides useful and practical learning of theoretical modelling of ionic transport processes

- Provides examples and illustrations

- Interdisciplinary - clearly shows the similarities between ionic transport processes in different fields

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