

# Chemical Reviews

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## Electrochemistry: Introduction

Electrochemistry spans the breadth of chemical science and extends into many other fields such as biology and engineering. While it is certainly a discipline in itself, with rapid ongoing advances and refinements in instrumentation and methodology, it can also be adapted to a wide variety of important chemical and technological problems. Accordingly, papers have been solicited from a cross section of world-recognized experts for this special issue of *Chemical Reviews* on "Electrochemistry".

Several reviews in this issue describe recent advances in electrochemical techniques. For example, the paper by Janata on potentiometric microsensors highlights one facet of the growing field of analytical microinstrumentation. An elegant treatment of an emerging spectroelectrochemical method, X-ray absorption spectroscopy, is provided by Sharpe, Heineman, and Elder. Andrieux, Hapiot, and Savéant describe methods for the determination of rate constants of fast reactions—submicrosecond time scales with ultramicroelectrodes and nanosecond time scales with redox catalyst techniques.

Other reviews emphasize mechanism. For example, Evans gives an insightful analysis of pathways of solution electron-transfer reactions. Peter reviews the dynamic aspects of semiconductor photoelectrochemistry. The surface coordination chemistry of ligands on metallic electrocatalysts is elegantly summarized by Soriaga. Dryhurst illustrates the biochemistry/electrochemistry interface with an account of the oxidation chemistry of central nervous system indoles.

A detailed understanding of interfacial and solvation phenomena is critical in electrochemistry. Accordingly, Parsons describes recent experimental and theoretical developments in the characterization of the electrochemical double layer. Coetzee, Deshmukh, and Liao review the characterization of solute-solvent interactions in nonaqueous media by potentiometric ion sensors. Couper, Pletcher, and Walsh describe the optimization of electrode materials for laboratory-scale electrosynthetic processes. Finally, Rolison gives an overview of zeolite-modified electrodes, including preparations and applications.

In summary, we believe that the 11 papers in this special issue convey both the breadth and excitement associated with this dynamic and evolving field. Single copies of this issue may be purchased at a modest price, as detailed on the masthead page.

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