# Book Review

**MODERN ASPECTS OF ELECTROCHEMISTRY** No.22 *Ed: J.O.'M. Bockris, B.E. Conway and Ralph E. White, Plenum Press* (1992); ISBN: 0-306-44061-X

The development taking place in Electrochemistry is so rapid that it inevitably calls for a comprehensive updating of the existing literature on various disciplines frequently. The Modern Aspects of Electrochemistry series, indeed, is proving itself equal to the task by presenting the various topics expertly through the writings of specialists in the respective fields. The present volume is a continuation of this noble tradition. The volume comprises of the following topics:

1. Analysis of the capacitance of the metal-solution interface.
2. Electrocatalytic oxidation of oxygenated aliphatic organic compounds at noble metal electrodes.
3. Surface states on semiconductors
4. Electro deposition of Nickel-iron alloys
5. Micro electrode techniques in Electrochemistry

The topics are so chosen that they cater to the requirements of researchers working in various disciplines.

The first chapter dealing with the Metal-solution capacitance, discusses the specific role of metal and metal-solvent coupling. A detailed analysis of various interactions such as metal-vacuum, metal-adsorbate, metal-solvent and metal-ion interactions are examined. Besides, the non negligible direct contribution of the metal to the capacitance arising out of its electronic structure is discussed. One feels that it would have been more useful to those working in the field of Corrosion and Electroplating, if the authors had discussed the effects of inhibitors and surfactants on the metal-solution interfacial capacitance in a broader sense.

The second chapter dealing with Electrocatalytic oxidation of oxygenated aliphatic organic compounds at noble metal Electrodes, is of tremendous importance in the field of Electrocatlytic studies and is of immediate relevance for chemical production and energy conversion. The article discusses various experimental methods for studying kinetics of electrocatalytic reaction and nature of adsorbed species with both electrochemical and spectroscopic technique. There is a detailed discussion on the characterisation of Electrode material and of catalytic surface such as real surface area, surface structure and surface composition etc. Specific examples of electrocatalytic oxidation of methanol and its oxidation products on noble metal electrodes have been discussed thoroughly. This chapter makes an extremely interesting reading and the authors must be congratulated for their clarity and lucidity in their writing.

The third chapter,dealing with surface states on semiconductors, is of specific interest to those researchers working in semiconductor Electrochemistry and photo-electrochemistry. The origin of surface states, their number density and their role in electron transfer processes are of considerable importance in understanding the surface chemistry of semiconductors in aqueous and non-aqueous electrolytes. The chapter is well written and will be certainly appreciated by all those working in this field.

Electro deposition of Nickel-iron alloys devices, is of great importance in Computer memory devices, micro-electronics and space technology. The chapter on this topic discusses the various parameters controlling the Ni-Fe electro deposition. The section on the properties of the Electro deposited Ni-Fe alloys discusses the effect of composition, stress and substrate in addition to the electrolysis conditions

The final chapter deals with micro electrode techniques in Electrochemistry. The micro electrodes differ from the conventional macro electrodes due to their different mass transport properties as well as reduced double layer capacitance and ohmic effects. This allows the technique to be used in studies of kinetics of fast electrode reactions. The chapter is a comprehensive review of the technique and is an useful compilation of the existing knowledge in this area.

Overall, this volume provides an extremely satisfying reading and is a must for various research groups working in the discipline of Electrochemistry.

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