BOOK REVIEW

MODERN ASPECTS OF ELECTRO-CHEMISTRY Vol 29 (Ed.) J.O.'M.Bockris, B.E.Conway and Ralph E.White, *Plenum Press, Newyork*. ISBN 0-306-45162-X (1996) 490 pages

The first chapter **Energies of Activation of Electrode reactions** deals with the classical problem of the electrode kinetics where, some of the problems of electrode kinetics such as temperature dependence of the energy of activation and symmetry factor are discussed. Clear definitions of some of the fundamental parameters in electrode kinetics are presented. The second chapter is on **the Electrochemical activation of catalytic reactions.** This theme is of substantial technological importance. The topic covers the area of solid ionic conductors and their electrocatalytic applications. The chapter covers solid Electrolyte Potentiometry (SEP) and the operating principles of solid oxide fuel cells. The effect of non-faradaic electrochemical modification of catalytic activity - **NEMCA effect** (whereby not only the electrocatalytic reaction, but also catalytic effect is affected by variation of potential of the working electrode) has been discussed in great detail and the technological importance brought out clearly.

The third chapter on **Effect of Surface structure and adsorption phenomenon on the active dissolution of iron in acid media** will be of interest to those who are working in the area of corrosion. The problem of iron dissolution in acid medium has pre-occupied many a researcher and this is one of the extensively studied systems in corrosion science. One of the interesting aspects discussed in this chapter is the process of super polarisation in the potential response to the galvanostatic pulse. The next chapter on **Electrochemical Investigation of the interfacial behaviour of proteins** is an excellent review on this emerging area of research. Several spectroscopic techniques for the study of the interfacial behaviour of proteins such as Ellipsometry, surface enhanced resonance Raman, Infrared reflection absorption spectroscopy, Attenuated total reflection infrared spectrometry, Total internal reflection fluorescence spectroscopy etc., have been reviewed in detail. There is a section devoted to Electrochemical adsorption studies.

The final chapter is on the **Chemisorption of thiols on Metals and metal sulphides**. The review focuses on chemisorbed species formed on these systems with particular emphasis on the mineral - collector interaction. There is a section on characterisation of thiol adsorption by non-electrochemical techniques - especially spectroscopic techniques. However a topic like this should have covered the fascinating aspect of alkane thiol adsorption on coinage metals which is great contemporary interest.

This volume will be of great utility to researchers working in the specialised areas covered here.

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MODERN ASPECTS OF ELECTRO-CHEMISTRY Vol 30 (Ed.) Ralph E.White, B.E.Conway and J.O.'M.Bockris *Plenum Press, Newyork* ISBN 0-306-45450-5 (1996) 541 pages

This volume contains five chapters written by scientists from academic and industrial laboratories.

Chapter 1 by Jaegermann deals with the **Semiconductor (SC)-electrolyte interface** with special emphasis on surface studies. The basic understanding of the electronic properties of the SC-electrolyte interface is brought out clearly. This is followed by the details on surface states and their quantum mechanical treatment. Applications of high vacuum techniques for the study of SC-electrolyte interface is elaborated with special reference to photoelectron spectroscopy, LEED and low energy ion scattering spectroscopy. Case studies based on Si, GaAs and layered dichalcogenides ($MoSe_2$, WSe_2 etc.) are given at the end. This chapter is up-to-date, highlighting many of the recent important papers in the area of surface studies on semiconductors.

Chapter 2 by Badaway highlights the principles and some recent improvements on the **Performance of photovoltaic and photoelectrochemical cells** based on schottky barrier heterojunctions. The usefulness of n-Si/ oxide schottky barrier solar cells for practical applications is explained in detail. This chapter will definitely stimulate research on photoelectrochemical solar energy conversion that is taking a rather low profile in recent years. Chapter 3 concerns the relationship between the **Morphology and the electrodeposition conditions of metal deposits**. The mechanism of different forms (course, spongy and dendritic) of growth are treated in detail with reference to mathematical, physical and real systems. In chapter 4, Anderson details an important area related to battery research namely, **the Behaviour of MnO_2 electrode in aqueous systems.** This is very important contribution considering the fact that the Zn-MnO_2 alkaline battery is the most popular battery in many of the industrialized nations today. The discharge mechanisms and the performance in different electrolytes are explained very well. There is no doubt that this chapter will be a welcome addition for laboratories working on batteries.

The last chapter by Mizuno and Enyo is **on Sorption of hydrogen on and in different metals in electrochemical environments**. Electrochemical techniques combined with others such as the use of deuteron beams are projected as means to get information on the hydrogen adsorption on and into different metals.

Overall, this volume is well produced and maintains the highest standard of earlier volumes in this series.

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