retain its position as an authoritative and up to date systematic compilation of our knowledge and understanding of materials. This is the prime objective of the Supplementary Volumes of the Encyclopedia of Materials Science and Engineering, of which this is the first. The Supplementary Volumes are designed to be used in conjunction with the Main Encyclopedia.

Supplementary Volume 1 contains 113 articles which fall into three categories; articles covering new materials, processing and characterization techniques, models and interpretations, all discovered or developed after the spring of 1985 when the main encyclopedia went to press; articles covering mature topics which for a variety of reasons were not treated in the main encyclopedia; and articles designed to bring the treatment of topics already covered in the main encyclopedia up to date. The later articles are divided into two subsidiary categories.

a) Supplementary articles which are intended to be read in conjunction with the original article of the same, or similar, title in the main encyclopedia; generally a subsidiary phrase such as "recent developments" has been added to the title.

b) Replacement articles which are intended to substitute entirely for the original article and therefore have the title of that article. These articles generally refer to topics in which there have been rapid recent developments: their inclusion does not imply a critical judgement on the original articles.

All articles in Supplementary Volume 1, are furnished with cross-references to relevant articles in the main encyclopedia as well as to other articles in this supplementary volume itself, where appropriate.

As with the Encyclopedia of Materials Science and Engineering itself the careful selection of experts by the two editors has resulted in comprehensive articles. If this standard is maintained in further supplementary volumes the encyclopedia will receive continuously increasing well justified attention and become a must for all libraries covering topics in materials science.

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Solid State Electrochemistry and its Applications to Sensors and Electronic Devices. By *K. S. Goto*. Elsevier Science Publishers, Amsterdam 1988. x, 454 pp., bound, US $ 119.50.—ISBN 0-444-42912-3.

The title of the book is somewhat misleading, implying that the coverage is much broader than it is in reality. It is in fact restricted to the electrochemistry of solid and liquid (melts, slags) oxides at temperatures in the range 200–2000 °C. The monograph is based on lecture notes of a course given by the author on this specific theme at the Tokyo Institute of Technology since 1971. About 100 "Problems" for discussion and calculations found in the appendix of the book are indicative of this origin.

The book can be divided roughly in two parts, chapters 1–9 "Fundamentals" and chapters 10–13 "Applications". In the course of the first part, which makes up about 60% of the book, a thorough treatment of the following fundamental properties of oxides is given from an electrochemical point of view:

a) Transport properties, diffusion, electronic and ionic conduction in binary oxides and multicomponent systems (chapters 2–5).

b) Thermodynamics of solid state galvanic cells, including the electrochemical Knudsen effusion cell. This is the only location, where the work of *H. Rickert* (erroneously cited throughout as "H. Richert") has been mentioned. His monographs on solid ionic electrochemistry are ignored, as is also the case (with one exception) for the pioneering work of *C. Wagner* (chapters 6–7).

c) Electrochemical kinetics. The chapters 8 and 9 are very useful and overpotential phenomena at the phase boundaries metal/solid oxide as well as metal/liquid-oxide melts are treated thoroughly. The author also introduces the use of the Pt-rotating disc electrode in $PbO–SiO_2$ melts at 1000 °C.

The final four chapters are devoted to various applications of solid state (sss) devices, with a strong emphasis on oxygen sensors for metallurgy and on MOS-sensors (another name for ISFETS; however, this term is not used in the book). In cooperation with the Japanese steel industry, the author has developed various sensor designs to measure the oxygen activity in molten iron as well as in molten slag. Typical values are 10^{-9} atm and 10^{-8} atm, respectively. Interesting correlations to the carbon content in the iron, the duration of oxygen blasting or the ratio of Fe^{III}/Fe^{II} in the slag have been found. This section is most authoritative, and the predominance of Japanese references is more justified here than in other parts of the book. The work of *Janke* et al. is also adequately discussed. Some parts, however, lie outside the scope "high temperature application" such as those in section 13.3 which include electrochromic displays, coulometric timers or pacemaker batteries. A brief account that electrochemical reactions are relevant to impurity effects and long term behavior (corrosion) of electronic devices, is given in chapter 1, but it is not followed up later in the book.

The typed manuscript has been directly reproduced, unfortunately without line balance, but typing errors are minimal. The price is high, as with many other specialized monographs, but although the variety of the possible subject matter in this area is extremely large, for example, stoichiometry, texture, phases and the result of various combinations, the book is clearly written and a guide in this broad field. It is also clear, that "in the future, many more electronic devices will surely be developed to utilize the physical and chemical properties of solid oxides".

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