

PREFACE

Since the development of the electrochemical theory of corrosion, electrochemical techniques have enjoyed a growing importance in the study of corrosion and corrosion protection. This experimentation has also been assisted by the parallel development of electronics and the widespread use of digital computer techniques for the optimization of relevant instrumentation.

Initially mainly steady-state electrochemical techniques were applied extensively in the study of corrosion and corrosion protection. Because steady-state techniques only provide information about the slowest step, transient techniques – in particular impedance measurements – have been adopted for a second stage of study to determine the different elementary steps involved in the overall process, thus providing a better knowledge of the mechanisms of corrosion and corrosion protection. Finally, still more recently, a new trend consists of coupling electrochemical techniques with in-situ spectroscopic and optical methods to get a better insight into the structure, the transport properties and the growth of the layers possibly developed on the metal surface.

To provide a forum for the discussion of the more recent developments in electrochemical methods and their application in the study of the process of corrosion and corrosion protection, an International Symposium was held in TOULOUSE - FRANCE, at the ECOLE NATIONALE SUPERIEURE DE CHIMIE, during July 9-12, 1985.

This Symposium was attended by 125 scientists and engineers representing FRANCE and eighteen foreign countries (BELGIUM, BRASIL, CANADA, EGYPT, ENGLAND, FINLAND, INDIA, IRAQ, ITALY, JAPAN, KUWAIT, THE NETHERLANDS, PORTUGAL, SPAIN, SWEDEN, SWITZERLAND, U.S.A. and VENEZUELA).

The proceedings of the 55 papers which were presented constitute contents of this volume. The presented papers were selected by the scientific committee on the basis of a review process of the extended abstracts. The topics covered in this proceedings volume include mass transport and hydrodynamics effects in corrosion and corrosion protection processes, electrochemical aspects of localized corrosion, electrochemical techniques for the study of stress corrosion and corrosion fatigue, mechanistic aspects of corrosion protection by inhibitors and coatings, development of novel techniques for the study of the mechanisms of corrosion and corrosion protection, and electrochemical methods applied to miscellaneous corrosion studies particularly those devoted to metallurgical aspects.

The general consensus of the Symposium was that significant advances have been undoubtedly achieved since the first Conference which was held at MANCHESTER, ENGLAND, in January 1982, particularly with regard to the use of impedance measurements now extended to the study of mass transport (Electrohydrodynamical impedance) and stress corrosion cracking (Mechanical impedance), the development of noise analysis techniques for the study of localized corrosion, stress corrosion cracking and the blistering of coatings, the stochastic approach of localized corrosion and the coupling of optical (Ellipsometry, Multichannel Optical Analysis...) and

spectroscopic (Raman, Mossbauer, ...) methods with various electrochemical techniques. I hope that further progress in these fields will be reported at the next Symposium.

I would like to take this opportunity to express my sincere thanks to the authors for their stimulating presentations, the other Symposium participants, the session chairmen, the scientific committee and the sponsoring organizations. Special acknowledgements are due to Professor Francis DABOSI who encouraged me to organize this Symposium, Robert A. COTTIS, Conference Organizer of the previous Symposium held in Manchester, whose advice was very useful and, last of all, to my colleagues and coworkers, in particular Nadine PEBERE for her continuous assistance to the Symposium.

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