# SPECIAL ISSUE

The German-American Colloquium on Electrochemical Passivation

# CORROSION SCIENCE

Editor-in-Chief: J. C. SCULLY, University of Leeds, U.K.

An Official Journal of the Institution of Corrosion Science and Technology

Volume 29, No. 2/3

1989

## CONTENTS

R. A. ORIANI and H. J. ENGELL	117	Introduction
H. J. ENGELL and R. A. ORIANI	119	Report on workshop group deliberations and discussions
Section 1: Formation of Passive Layer.	s	
K. E. HEUSLER	131	The influence of electrolyte composition on the formation and dissolution of passivating films
J. KRUGER	149	The nature of the passive film on iron and ferrous alloys
S. HAUPT and HH. STREHBLOW	163	Combined electrochemical and surface analytical investiga- tions of the formation of passive layers
R. KIRCHHEIM	183	The growth kinetics of passive films and the role of defects
H. GERISCHER	191	Remarks on the electronic structure of the oxide film on passive iron and the consequences for its electrode behaviour
Section 2: Properties of Passive Layers	s	
M. H. DEAN and U. STIMMING	199	The electronic properties of disordered passive films
J. W. HALLEY	213	Theoretical issues in electronic structure of the passivation layer
E. Leiva, P. Meyer and	225	Electron transfer through passive films: role of localized
W. SCHMICKLER		electronic states
A. T. Fromhold Jr and	237	The transport of ions and electrons through microscopically
S. J. Noh		inhomogeneous passive films: breakdown implications
H. GERISCHER	257	Models for the discussion of the photo-electrochemical

Contents continued on outside back cover



PERGAMON PRESS

Oxford

New York

Beijing

Frankfurt

São Paulo

Sydney

Tokyo

Toronto

# CORROSION SCIENCE VOL. 29, NO. 2/3

### Continued from front cover

W. J. PLIETH and HJ. RIEGER	267	Investigation of passive films with laser pulses
K. JÜTTNER, W. J. LORENZ and	279	The role of surface inhomogeneities in corrosion processes—
W. PAATSCH		electrochemical impedance spectroscopy (EIS) on different aluminium oxide films
Section 3: Breakdown and Repair of I	Passive La	nyers
J. O'M. BOCKRIS	291	Spectroscopic observations on the nature of passivity
H. S. ISAACS	313	The localized breakdown and repair of passive surfaces during pitting
H. W. PICKERING	325	The significance of the local electrode potential within pits, crevices and cracks
L. ELFENTHAL, J. W. SCHULTZE and O. MEYER	343	The simulation of radiation damage in oxide films by ion implantation
M. BAUMGÄRTNER and H. KAESCHE	363	Microtunnelling during localized attack of passive aluminum: the case of salt films vs oxide films
F. BECK	379	The wear mechanism of activated titanium anodes under current flow
	389	Corrosion Diary

Indexed/Abstracted in
Current Contents, Engng Ind. Monthly
& Author Index, PASCAL/CNRS Database,
Corrosion Abstracts, Metals Abstracts,
Chemical Abstracts, INSPEC Database,
BMT Abstracts, Petroleum Abstracts

ISSN 0010-938X CRRSA 29 (2/3) 117-390 (1989)



**PERGAMON PRESS** 

Oxford

New York

Beijing

Published by

Frankfurt

São Paulo

Sydney

Tokyo

Toronto