

CORROSION REVIEWS

EDITORS-IN-CHIEF

Ronald M. Latanision, Natick, MA

Raúl B. Rebak, Schenectady, NY

INTERNATIONAL EDITORIAL BOARD

Carmen Andrade, Madrid

Francesco Bellucci, Naples

Neal Berke, Kalamazoo, MI

Nick Birbilis, Clayton

Noam Eliaz, Tel Aviv

Gerald S. Frankel, Columbus, OH

Eliezer Gileadi, Tel Aviv

Hiroki Habazaki, Sapporo

Hannu E. Hänninen, Aalto

Lloyd H. Hihara, Honolulu, HI

Robert G. Kelly, Charlottesville, VA

Philippe Marcus, Paris

Kamachi Mudali, Kalpakkam

R. Winston Revie, Ottawa

Martín A. Rodríguez, Buenos Aires

Barbara A. Shaw, University Park, PA

S. Ray Taylor, Houston, TX

George E. Thompson, Manchester

Sannakaisa Virtanen, Erlangen

DE GRUYTER

ABSTRACTED/INDEXED IN Baidu Scholar · Cabell's Directory · Chemical Abstracts Service (CAS): CAplus; SciFinder · CNKI Scholar (China National Knowledge Infrastructure) · CNPIEC: cnpLINKer · Compendex · Dimensions · EBSCO (relevant databases) · EBSCO Discovery Service · Engineering Village · Fluidex · Gale/Cengage · Genamics JournalSeek · Google Scholar · Inspec · Japan Science and Technology Agency (JST) · J-Gate · Journal Citation Reports/Science Edition · JournalGuide · JournalTOCs · KESLI-NDSL (Korean National Discovery for Science Leaders) · Microsoft Academic · Naviga (Softweco) · Paperbase · Pirabase · Polymer Library · Primo Central (ExLibris) · ProQuest (relevant databases) · Publons · QOAM (Quality Open Access Market) · ReadCube · Reaxys · SCImago (SJR) · SCOPUS · Sherpa/RoMEO · Summon (Serials Solutions/ProQuest) · TDNet · TEMA Technik und Management · Ulrich's Periodicals Directory/ulrichsweb · WanFang Data · Web of Science: Science Citation Index Expanded · WorldCat (OCLC)

The publisher, together with the authors and editors, has taken great pains to ensure that all information presented in this work (programs, applications, amounts, dosages, etc.) reflects the standard of knowledge at the time of publication. Despite careful manuscript preparation and proof correction, errors can nevertheless occur. Authors, editors and publisher disclaim all responsibility for any errors or omissions of liability for the results obtained from use of the information, or parts thereof, contained in this work.

The citation of registered names, trade names, trademarks, etc. in this work does not imply, even in the absence of a specific statement, that such names are exempt from laws and regulations protecting trademarks etc. and therefore free for general use.

ISSN 0334-6005 · e-ISSN 2191-0316

All information regarding notes for contributors, subscriptions, Open access, back volumes and orders is available online at <https://www.degruyter.com/corrrev>

RESPONSIBLE EDITORS Prof. Ronald M. Latanision, Exponent® Failure Analysis Associates, 1075 Worcester Street, Natick, MA 01760, USA, e-mail: rlatanision@exponent.com

Dr. Raúl B. Rebak, General Electric Global Research, 1 Research Circle, CEB2551, Schenectady, NY 12309, USA, e-mail: rebak@ge.com

PUBLISHER Walter de Gruyter GmbH, Berlin/Boston, Genthiner Straße 13, 10785 Berlin, Germany

JOURNAL MANAGER Dr. Gunda Stöber, De Gruyter, Genthiner Straße 13, 10785 Berlin, Germany, Tel.: +49 (0)30 260 05-279, Fax: +49 (0)30 260 05-298, e-mail: corros.rev.editorial@degruyter.com

RESPONSIBLE FOR ADVERTISEMENTS Kevin Göthling, De Gruyter, Genthiner Straße 13, 10785 Berlin, Germany, e-mail: anzeigen@degruyter.com

© 2021 Walter de Gruyter GmbH, Berlin/Boston

TYPESETTING TNQ Technologies, Chennai, India

PRINTING Franz X. Stückle Druck und Verlag e.K., Ettenheim



Contents

Reviews

Christopher D. Taylor and Huibin Ke
Investigations of the intrinsic corrosion and hydrogen susceptibility of metals and alloys using density functional theory — 177

Sharayu Govardhane and Pravin Shende
Integration of green nanotechnology with silica for corrosion inhibition — 211

Sen Tang, Chengyuan Zhu, Gan Cui, Xiao Xing, Jie Mu and Zili Li
Analysis of internal corrosion of supercritical CO₂ pipeline — 219

Deepak Dhand, Parlad Kumar and Jasmaninder Singh Grewal
A review of thermal spray coatings for protection of steels from degradation in coal fired power plants — 243

Original articles

Natalia Makuch and Piotr Dziarski
The importance of phase composition for corrosion resistance and thermal oxidation behavior of gas-borided layer produced on nickel alloy — 269

Mohamed Ouknin, Amal Boumezzourh, Zouhair Lakbaibi, Pierre Ponthiaux, Jean Costa and Lhou Majidi
Tribological behavior of stainless steel in sulfuric acid in the presence of *Thymus zygis* subsp. *gracilis* essential oil: experimental and quantum chemical studies — 279