
Electrochemical Impedance Spectroscopy: Modeling and Interpretation

Editors:

P. Vanýsek

Northern Illinois University
DeKalb, Illinois, USA

V. Lvovich

Electrochemical Sciences Consulting
Cleveland Heights, Ohio, USA

M. E. Orazem

University of Florida
Gainesville, Florida, USA

H. De Long

Air Force Office of Scientific Research
Arlington, Virginia, USA

D. C. Hansen

University of Dayton
Dayton, Ohio, USA

Sponsoring Divisions:



Physical and Analytical Electrochemistry



Corrosion



Industrial Electrochemistry and Electrochemical Engineering



Sensor



Published by

The Electrochemical Society

65 South Main Street, Building D
Pennington, NJ 08534-2839, USA

tel 609 737 1902

fax 609 737 2743

www.electrochem.org

ecstransactions™

Vol. 45, No. 13

Copyright 2013 by The Electrochemical Society.
All rights reserved.

This book has been registered with Copyright Clearance Center.
For further information, please contact the Copyright Clearance Center,
Salem, Massachusetts.

Published by:

The Electrochemical Society
65 South Main Street
Pennington, New Jersey 08534-2839, USA

Telephone 609.737.1902
Fax 609.737.2743
e-mail: ecs@electrochem.org
Web: www.electrochem.org

ISSN 1938-6737 (online)
ISSN 1938-5862 (print)
ISSN 2151-2051 (cd-rom)

ISBN 978-1-62332-019-5 (PDF)
ISBN 978-1-60768-370-4 (Softcover)

Printed in the United States of America.

ECS Transactions, Volume 45, Issue 13
Electrochemical Impedance Spectroscopy: Modeling and Interpretation

Table of Contents

Preface iii

**Chapter 1
Methodology in EIS**

(Invited) Dynamic and Coverage Effects in EIS 3
D. A. Harrington

(Invited) Interpretation of Dielectric Properties for Materials showing Constant-Phase-
Element (CPE) Impedance Response 15
*M. E. Orazem, B. Tribollet, V. Vivier, S. Marcelin, N. Pébère, A. L. Bunge, E. A. White,
D. P. Riemer, I. Frateur, M. Musiani*

Multi-Sine EIS- Drift, Non Linearity and Solution Resistance Effects 37
R. Srinivasan, V. Ramani, S. Santhanam

Impedance Analysis of Ion Transportation in Hierarchical Porous Core-Shell Carbons with
Transmission Line Model 51
C. Yang, C. Y. V. Li, F. Li, K. Y. Chan

**Chapter 2
Material Studies in EIS**

In Situ Performance Analysis of a High Temperature PEM Fuel Cell Stack at Loads 67
Y. Zhu, W. H. Zhu, B. J. Tatarchuk

The French SIMCAL Research Network For Modelling of Calendar Aging for Energy
Storage System in EVs And HEVs - EIS Analysis on LFP/C Cells 73
S. Grolleau, B. Molina-Concha, A. Delaille, R. Revel, J. Bernard, S. Pélissier, J. Peter

Author Index 83