

MRS

Advances

Energy and Environment

<https://doi.org/10.1557/adv.2016.599> Published online by Cambridge University Press

MRS

MATERIALS
RESEARCH
SOCIETY®

CAMBRIDGE
UNIVERSITY PRESS

MRS Advances: Energy and Environment

Associate Editor:

David F. Bahr, *Purdue University*

Principal Editors:

Talia Gershon, *IBM*

Rita Toth, *Empa*

Anita Ho-Baillie, *The University of New South Wales*

M. Parans Paranthaman, *Oak Ridge National Laboratory*

Donghai Wang, *The Pennsylvania State University*

Haleh Ardebili, *University of Houston*

Mitchell Anstey, *Sandia National Laboratories*

Yuyan Shao, *Pacific Northwest National Laboratory*

Jason Bara, *University of Alabama*

Nini Pryds, *Danmarks Tekniske Universitet*

Karl Whittle, *University of Liverpool*

Yang Yang Li, *City University of Hong Kong*

Ashley White, *E O Lawrence Berkeley*

National Laboratory

MRS Advances Editorial Board:

Chair: David F. Bahr, *Purdue University*

Asa Barber, *University of Portsmouth,*

United Kingdom

Elizabeth L. Fleischer, *Materials Research Society*

Marian Kennedy, *Clemson University*

Marilyn L. Minus, *Northeastern University*

Roger J. Narayan, *University of North*

Carolina/North Carolina State University

Materials Research Society Editorial Office, Warrendale, PA:

Ellen W. Kracht, *Publications Manager*

Susan Dittrich, *Journals Editorial Assistant*

Kirby L. Morris, *Journals Production Assistant*

Eileen M. Kiley, *Director of Communications*

Disclaimer

Authors of each article appearing in this Journal are solely responsible for all contents in their article(s) including accuracy of the facts, statements, and citing resources. Facts and opinions are solely the personal statements of the respective authors and do not necessarily represent the views of the editors, the Materials Research Society, or Cambridge University Press.

MRS Advances (EISSN: 2059-8521) is published by Cambridge University Press, One Liberty Plaza, Floor 20, New York, NY 10006 for the Materials Research Society.

Copyright © 2016, Materials Research Society. All rights reserved. No part of this publication may be reproduced, in any form or by any means, electronic, photocopying, or otherwise, without permission in writing from Cambridge University Press. Policies, request forms and contacts are available at: <http://www.cambridge.org/rights/permissions/permission.htm>. Permission to copy (for users in the USA) is available from Copyright Clearance Center at: <http://www.copyright.com>, email: info@copyright.com.

Purchasing Options:

Premium Subscription- Premium Subscription includes current subscription and one year's lease access to the full MRS Online Proceedings Library Archive for \$6,875.00 / £4,655.00 / €6,330.00. *Subscription-* Subscription with perpetual access to the content subscribed to in a given year, including three years of back-file lease access to content from the MRS Online Proceedings Library Archive. The price for a 2016 subscription is \$2,875.00 / £1,855.00 / €2,500.00. *MRS Members-* Access to *MRS Advances* is available to all MRS members without charge.

Contact Details:

For all inquiries about pricing and access to *MRS Advances*, please get in touch via the following email addresses: online@cambridge.org (for the Americas); library.sales@cambridge.org (for UK, Europe, and rest of world).

journals.cambridge.org/adv

CONTENTS

* Innovative Approaches to Addressing the Fundamental Materials Challenges in Hydrogen and Fuel Cell Technologies	3107
Eric L. Miller, Katie Randolph, David Peterson, Neha Rustagi, Kim Cierpiak-Gold, Ben Klahr, and J. Carlos Gomez	
Surface-Charge-Enabled Photolytic Hydrogen Generation In $V_2O_5 \cdot H_2O/Au$ Nanoconjugates	3121
Sunith Varghese, Charuksha Walgama, Mark Wilkins, Sadagopan Krishnan, and Kaan Kalkan	
The Features of TiO_2 Films Structure Formation under Conditions of Electrochemical Anodizing by Direct Current with Variable Component Application	3127
Sergey M. Karabanov, Dmitriy V. Suvorov, Gennadiy P. Gololobov, Yulia M. Stryuchkova, Maria A. Klyagina, and Evgeniy V. Slivkin	
Optical Properties of Multilayers $TiO_2/SnO_2:F$ Thin films	3133
Eleicer Ching-Prado, Amanda Watson, Héctor Miranda, and Ildeman Abrego	
Voltage-controlled Reactive Magnetron Sputtering of Nb-doped TiO_2 Films: Electrical and Optical Properties	3139
Stefan Seeger, Klaus Ellmer, Michael Weise, Johanna Reck, and Rainald Mientus	
Directly Grown TiO_2 Nanotubes on Carbon Nanofibers for Photoelectrochemical Water Splitting	3145
Hyungkyu Han, Stepan Kment, Anandarup Goswami, Ondrej Haderka, and Radek Zboril	
Surface Composition of TiO_2-Zn Nanotubes by NanoSIMS	3151
Indu B. Mishra, Diana Khusnutdinova, and William T. Petuskey	

*Invited Paper

Facile Preparation of TiO₂-SnO₂ Catalysts using TiO₂ as an Auxiliary for Gas Sensing and Advanced Oxidation Processes. 3157
Ritu Malik, Vijay K. Tomer, Surender Duhan,
Pawan S. Rana, and S. P. Nehra

Formation of TiO₂ Electrically Insulated Oxide Coatings in Mode of Alternating Current Application. 3163
Sergey M. Karabanov, Dmitry V. Suvorov,
Gennady P. Gololobov, Yulia M. Stryuchkova,
Maria A. Klyagina, and Evgeniy V. Slivkin

Ropy Foam-like TiO₂ Film Grown by Water-based Process for Electron-Conduction Layer of Perovskite Solar Cells 3169
Sarmad Fawzi Hamza Alhasan,
Farnood Khalilzadeh-Rezaie, Robert E. Peale,
and Isaiah O. Oladeji