

MRS Advances

# Energy Materials and Technologies

<https://doi.org/10.1557/adv.2018.576> Published online by Cambridge University Press

# MRS Advances: Energy Materials and Technologies

## Associate Editors:

Marian Kennedy, *Clemson University, USA*  
Elizabeth L. Fleischer, *Materials Research Society, USA*

## Principal Editors:

Marilyn Minus, *Northeastern University, USA*  
Jens Hähnisch, *Karlsruhe Institute of Technology, Germany*  
Sudhir Kulkarni, *Air Liquide, USA*  
Yang Shen, *Tsinghua University, China*  
Haleh Ardebili, *University of Houston, USA*  
James G. Tobin, *University of Wisconsin-Oshkosh, USA*  
Anita Ho-Baillie, *University of New South Wales, Australia*  
Xiaoliang Wei, *Pacific Northwest National Laboratory, USA*  
Xun Shi, *Shanghai Institute of Ceramics, China*  
Peng Wang, *King Abdullah University of Science and Technology, Saudi Arabia*

Simerjeet K. Gill, *Brookhaven National Laboratory, USA*  
Thierry Brousse, *Institut des Matériaux Jean Rouxel, France*  
Hyun-Wook Lee, *Ulsan National Institute of Science and Technology, South Korea*  
Yi-Yang Sun, *Shanghai Institute of Ceramics, Chinese Academy of Sciences, China*  
Chaitanya Deo, *Georgia Institute of Technology, USA*  
Lin Zhou, *Nanjing University, China*  
Elizabeth Podlaha-Murphy, *Clarkson University, USA*

## MRS Advances Editorial Board:

**Editor-in-Chief:** David F. Bahr, *Purdue University, USA*  
Asa Barber, *University of Portsmouth, United Kingdom*  
Meenakshi Dutt, *Rutgers University, USA*  
Elizabeth L. Fleischer, *Materials Research Society, USA*

Marian Kennedy, *Clemson University, USA*  
Marilyn L. Minus, *Northeastern University, USA*  
Roger J. Narayan, *University of North Carolina/North Carolina State University, USA*  
Ruth Schwaiger, *Karlsruhe Institute of Technology, Germany*  
Jeremy Theil, *Mountain View Energy, USA*

## 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 © 2018, 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](mailto: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 \$7,219.00 / £4,888.00 / €6,647.00. *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 2018 subscription is \$3,019.00 / £1,948.00 / €2,625.00. *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](mailto:online@cambridge.org) (for the Americas); [library.sales@cambridge.org](mailto:library.sales@cambridge.org) (for UK, Europe, and rest of world).

[cambridge.org/adv](http://cambridge.org/adv)

# CONTENTS

<b>Non-vacuum Preparation of <math>wse_2</math> Thin Films <i>via</i> the Selenization of Hydrated Tungsten Oxide Prepared using Chemical Solution Methods . . . . .</b>	<b>3281</b>
Christopher L. Exstrom, Scott A. Darveau, Megan E. Falconer, Jessica R. Blum, Whitney M. Colling, and Natale J. Ianno	
<b>3D Distributions of Chlorine and Sulphur Impurities in a Thin-film Cadmium Telluride Solar Cell . . . . .</b>	<b>3287</b>
Thomas A.M. Fiducia, Kexue Li, Amit H. Munshi, Kurt Barth, Walajabad S. Sampath, Chris R.M. Grovenor, and John M. Walls	
<b>Low Temperature Photoluminescence Spectroscopy of Defect and Interband Transitions in <math>CdSe_xTe_{1-x}</math> Thin Films . . . . .</b>	<b>3293</b>
Niraj Shrestha, Corey R. Grice, Ebin Bastola, Geethika K. Liyanage, Adam B. Phillips, Michael J. Heben, Yanfa Yan, and Randy J. Ellingson	
<b>Tin Disulfide-oxide (<math>SnS_{2-x}O_x</math>) as n-type Heterojunction Layer Processed by Chemical Bath Technique for Cd Free Fabrication of Compound Semiconductor Thin Film Solar Cells . . . . .</b>	<b>3301</b>
Omar Asif and Alok C. Rastogi	
<b>Antimony Sulfide Thin Films Obtained by Chemical Bath Deposition using Tartaric Acid as Complexing Agent . . . . .</b>	<b>3307</b>
J. Escorcia-García, M. Domínguez-Díaz, A. Hernández-Granados, and H. Martínez	
<b>A First Principles Study on the Electronic, Optical and Hole Effective Mass Properties of Mg-doped <math>CuAlO_2</math> and <math>AgAlO_2</math> . . . . .</b>	<b>3315</b>
James Shook, Pablo D. Borges, and Luisa Scolfaro	
<b>XRPD and Scanning Electron Microscopy of Alloys of the <math>CuAlS_2 - CuFeS_2</math> System Prepared by Thermobaric Treatment . . . .</b>	<b>3323</b>
Barys Korzun and Anatoly Pushkarev	