PROCEEDINGS OF SPIE

SPIDigitalLibrary.org/conference-proceedings-of-spie

Front Matter: Volume 11084

, "Front Matter: Volume 11084," Proc. SPIE 11084, Physical Chemistry of Semiconductor Materials and Interfaces XVIII, 1108401 (30 September 2019); doi: 10.1117/12.2552528

SPIE.

Event: SPIE Nanoscience + Engineering, 2019, San Diego, California, United States

PROCEEDINGS OF SPIE

Physical Chemistry of Semiconductor Materials and Interfaces XVIII

Christian Nielsen
Daniel Congreve
Hugo A. Bronstein
Felix Deschler
Editors

11–13 August 2019
San Diego, California, United States

Sponsored and Published by
SPIE

Volume 11084

Proceedings of SPIE 0277-786X, V. 11084

SPIE is an international society advancing an interdisciplinary approach to the science and application of light.

Physical Chemistry of Semiconductor Materials and Interfaces XVIII, edited by Christian Nielsen,
Daniel Congreve, Hugo A. Bronstein, Felix Deschler, Proc. of SPIE Vol. 11084, 1108401
© 2019 SPIE · CCC code: 0277-786X/19/\$21 · doi: 10.1117/12.2552528

Proc. of SPIE Vol. 11084 1108401-1

The papers in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. Additional papers and presentation recordings may be available online in the SPIE Digital Library at SPIDigitalLibrary.org.

The papers reflect the work and thoughts of the authors and are published herein as submitted. The publisher is not responsible for the validity of the information or for any outcomes resulting from reliance thereon.

Please use the following format to cite material from these proceedings:

Author(s), "Title of Paper," in *Physical Chemistry of Semiconductor Materials and Interfaces XVIII*, edited by Christian Nielsen, Daniel Congreve, Hugo A. Bronstein, Felix Deschler, Proceedings of SPIE Vol. 11084 (SPIE, Bellingham, WA, 2019) Seven-digit Article CID Number.

ISSN: 0277-786X
ISSN: 1996-756X (electronic)

ISBN: 9781510628618
ISBN: 9781510628625 (electronic)

Published by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA
Telephone +1 360 676 3290 (Pacific Time) · Fax +1 360 647 1445
SPIE.org

Copyright © 2019, Society of Photo-Optical Instrumentation Engineers.

Copying of material in this book for internal or personal use, or for the internal or personal use of specific clients, beyond the fair use provisions granted by the U.S. Copyright Law is authorized by SPIE subject to payment of copying fees. The Transactional Reporting Service base fee for this volume is \$21.00 per article (or portion thereof), which should be paid directly to the Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, MA 01923. Payment may also be made electronically through CCC Online at copyright.com. Other copying for republication, resale, advertising or promotion, or any form of systematic or multiple reproduction of any material in this book is prohibited except with permission in writing from the publisher. The CCC fee code is 0277-786X/19/\$21.00.

Printed in the United States of America by Curran Associates, Inc., under license from SPIE.

Publication of record for individual papers is online in the SPIE Digital Library.

**SPIE. DIGITAL
LIBRARY**

SPIDigitalLibrary.org

Paper Numbering: *Proceedings of SPIE* follow an e-First publication model. A unique citation identifier (CID) number is assigned to each article at the time of publication. Utilization of CIDs allows articles to be fully citable as soon as they are published online, and connects the same identifier to all online and print versions of the publication. SPIE uses a seven-digit CID article numbering system structured as follows:

- The first five digits correspond to the SPIE volume number.
- The last two digits indicate publication order within the volume using a Base 36 numbering system employing both numerals and letters. These two-number sets start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B ... 0Z, followed by 10-1Z, 20-2Z, etc. The CID Number appears on each page of the manuscript.

Contents

v	<i>Authors</i>
vii	<i>Conference Committee</i>

OPTO-ELECTRONIC DEVICES

11084 02	Carrier dynamics in small-gap mercury chalcogenide colloidal quantum dots [11084-1]
----------	--

ENERGY CONVERSION AND STORAGE

11084 0A	Influence of micelle charge density on adsorption and exciton delocalization of conjugated polyelectrolytes (Invited Paper) [11084-8]
----------	--

NEW MATERIALS AND DIRECTIONS

11084 0E	Evaluation of the role that photoacid excited-state acidity has on photovoltage and photocurrent of dye-sensitized ion-exchange membranes (Invited Paper) [11084-12]
----------	---

METAL HALIDE PEROVSKITE PHYSICS AND APPLICATIONS I

11084 0F	Hot-carrier cooling in lead-bromide perovskite materials [11084-13]
11084 0G	Ultrafast photophysics of metal halide perovskite multiple quantum wells: device implications and reconciling band alignment (Invited Paper) [11084-14]

METAL HALIDE PEROVSKITE PHYSICS AND APPLICATIONS II

11084 0J	Single-source flash sublimation of metal-halide semiconductors (Invited Paper) [11084-17]
11084 0L	Ultrafast dynamics in QD based photoelectrochemical cells (Invited Paper) [11084-19]

ORGANIC SEMICONDUCTORS: ELECTRONIC PROPERTIES AND DEVICES

11084 0N	Effect of local environment on aggregate electronic properties of P3HT [11084-21]
----------	--

11084 0Q

Design principles for efficient singlet fission in anthracene-based organic semiconductors
[11084-24]

Authors

Numbers in the index correspond to the last two digits of the seven-digit citation identifier (CID) article numbering system used in Proceedings of SPIE. The first five digits reflect the volume number. Base 36 numbering is employed for the last two digits and indicates the order of articles within the volume. Numbers start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B...0Z, followed by 10-1Z, 20-2Z, etc.

Abdellah, Mohamed, 0L	White, William, 0E
Ardo, Shane, 0E	Wu, Yi-Lin, 0Q
Ayzner, Alexander L., 0A	Young, Ryan M., 0Q
Bae, Youn Jue, 0Q	Zheng, Kaibo, 0L
Bakulin, Artem A., 0F	Zhou, Jiawang, 0Q
Baranov, Mikhail S., 0E	
Bhide, Rohit, 0E	
Bodnarchuk, Maryna I., 0F	
Chabera, Pavel, 0L	
Christensen, Joseph A., 0Q	
Crane, Matthew J., 0J	
de Angelis, Filippo, 0G	
Elkins, Madeline H., 0G	
Gamelin, Daniel R., 0J	
Gorodetsky, Andrei A., 0F	
Gorton, Lo, 0L	
Guyot-Sionnest, Philippe, 02	
Hollingsworth, William R., 0A	
Honarfar, Alireza, 0L	
Hopper, Thomas R., 0F	
Huang, Xiaokung, 0F	
Johnston, Anna R., 0A	
Kang, Gyeongwon, 0Q	
Kelley, Shana O., 0G	
Kovalenko, Maksym V., 0F	
Kramer, Stephanie N., 0N	
Krieg, Franziska, 0F	
Kroupa, Daniel M., 0J	
Lovrincic, Robert, 0F	
Luo, Simon, 0E	
Mahata, Arup, 0G	
Mallikas, Christos D., 0Q	
Melnychuk, Christopher, 02	
Mourad, Hassan, 0L	
Nelson, Jordan N., 0Q	
Pankratova, Galina, 0L	
Peteanu, Linda A., 0N	
Proppe, Andrew, 0G	
Pullerits, Tõnu, 0L	
Quintero-Bermudez, Rafael, 0G	
Rajkovic, Ivan, 0A	
Sanborn, Christopher D., 0E	
Sargent, Edward H., 0G	
Schatz, George C., 0Q	
Scholes, Gregory D., 0G	
Segura, Carmen J., 0A	
Solntsev, Kyriil M., 0E	
Van Duyne, Richard P., 0Q	
Wasielewski, Michael R., 0Q	

Conference Committee

Symposium Chairs

Halina Rubinsztein-Dunlop, The University of Queensland (Australia)
Mark L. Brongersma, Geballe Laboratory for Advanced Materials
(GLAM) (United States), Stanford University (United States)

Symposium Co-chairs

Reuven Gordon, University of Victoria (Canada)
Natalia M. Litchinitser, Duke University (United States)

Conference Chairs

Christian Nielsen, Queen Mary University of London (United Kingdom)
Daniel Congreve, The Rowland Institute at Harvard (United States)

Conference Co-chairs

Hugo A. Bronstein, University of Cambridge (United Kingdom)
Felix Deschler, University of Cambridge (United Kingdom)

Conference Program Committee

John B. Asbury, The Pennsylvania State University (United States)
Artem A. Bakulin, Imperial College London (United Kingdom)
Natalie Banerji, Universität Bern (Switzerland)
Jenny Clark, The University of Sheffield (United Kingdom)
Alexandre Fürstenberg, Université de Genève (Switzerland)
David S. Ginger, University of Washington (United States)
Robert Lovrincic, Technische Universität Braunschweig (Germany)
Naomi S. Ginsberg, University of California, Berkeley (United States)
Paul Meredith, Swansea University (United Kingdom)
Linda A. Peteanu, Carnegie Mellon University (United States)
Carlos Silva, Georgia Tech Research Institute (Canada)
Sergei Tretiak, Los Alamos National Laboratory (United States)
Lauren Webb, The University of Texas at Austin (United States)

Session Chairs

- 1 Opto-Electronic Devices
Christian Nielsen, Queen Mary University of London (United Kingdom)
Daniel Congreve, The Rowland Institute at Harvard (United States)

- 2 Energy Conversion and Storage
Christian Nielsen, Queen Mary University of London (United Kingdom)
Daniel Congreve, The Rowland Institute at Harvard (United States)
- 3 New Materials and Directions
Christian Nielsen, Queen Mary University of London (United Kingdom)
Daniel Congreve, The Rowland Institute at Harvard (United States)
- 4 Metal Halide Perovskite Physics and Applications I
Kenneth Graham, University of Kentucky (United States)
- 5 Metal Halide Perovskite Physics and Applications II
Christian Nielsen, Queen Mary University of London (United Kingdom)
- 6 Organic Semiconductors: Electronic Properties and Devices
Chad Risko, University of Kentucky (United States)
- 7 Organic Semiconductors: Molecular Design, Structure, and Assembly
Moritz K. Riede, University of Oxford (United Kingdom)
- 8 Interfaces in Organic and Hybrid Solar Cells: Joint Session with
Conferences 11084 and 11094
Ifor D.W. Samuel, University of St. Andrews (United Kingdom)
Christian Nielsen, Queen Mary University of London (United Kingdom)
Daniel Congreve, The Rowland Institute at Harvard (United States)