PROCEEDINGS OF SPIE

Organic, Hybrid, and Perovskite Photovoltaics XXIV

Gang Li Natalie Stingelin Ana Flávia Nogueira Thuc-Quyen Nguyen Ellen Moons Barry P. Rand Editors

22–24 August 2023 San Diego, California, United States

Sponsored by SPIE

Co-sponsored by Enli Technology Company Ltd. (Taiwan)

Published by SPIE

Volume 12660

Proceedings of SPIE 0277-786X, V. 12660

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

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 SPIEDigitalLibrary.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 Organic, Hybrid, and Perovskite Photovoltaics XXIV, edited by Gang Li, Natalie Stingelin, Ana Flávia Nogueira, Thuc-Quyen Nguyen, Ellen Moons, Barry P. Rand, Proc. of SPIE 12660, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

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

ISBN: 9781510665347 ISBN: 9781510665354 (electronic)

Published by **SPIE** P.O. Box 10, Bellingham, Washington 98227-0010 USA Telephone +1 360 676 3290 (Pacific Time) SPIE.org Copyright © 2023 Society of Photo-Optical Instrumentation Engineers (SPIE).

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 fees. To obtain permission to use and share articles in this volume, visit Copyright Clearance Center 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.

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.



Paper Numbering: A unique citation identifier (CID) number is assigned to each article in the Proceedings of SPIE 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 Conference Committee

ORGANIC AND HYBRID MATERIALS IN PHOTOVOLTAICS: JOINT SESSION WITH CONFERENCES 12650 AND 12660 12660 02 Photostability of Y-type electron acceptor molecules and related copolymer [12660-2] **DEVICES: OPVS, PHOTODETECTORS, AND BEYOND** 12660 03 High-reproducibility production of solution processable near-infrared organic photodiode materials and inks for the image sensor industry [12660-12] **DEVICES: IMPLEMENTATION AND LIGHT/HEAT MANAGEMENT** 12660 04 Leveraging extraordinary optical properties of inorganic lead halide perovskites for photonic luminescent solar concentrators [12660-15] **DEVICES: PSC** 12660 05 Tin based perovskite solar cells and all-perovskite tandem solar cells [12660-18] **DEVICE PHYSICS AND FABRICATION** 12660 06 Aging and characterization of high-bandgap perovskites for all thin-film tandem solar cell devices [12660-28] Vapor transport deposition of metal-halide perovskites solar cells [12660-30] 12660 07 POSTER SESSION 12660 08 Secondary ion mass spectrometry study of organic and inorganic interfaces in methylammonium lead triiodide solar cells [12660-41]

- 12660 09 Photo electromotive force induced by running fringes for determination of ion mobility in perovskite semiconductors [12660-43]
- 12660 0A Effect of reaction temperature on CsPbBr₃ perovskite quantum dots with photovoltaic applications [12660-44]
- 12660 OB Reduced graphene oxide (rGO)-CsSnl₃ nanocomposites: a cost-effective technique to improve the structural and optical properties for optoelectronic device applications [12660-47]
- 12660 0C **2D modeling of perovskite/Si tandem solar cell** [12660-48]