PROCEEDINGS OF SPIE

Advances in Patterning Materials and Processes XXXVIII

Daniel P. Sanders Douglas Guerrero Editors

22–26 February 2021
Online Only, United States

Sponsored by SPIE

Cosponsored by TEL Tokyo Electron, Ltd. (Japan)

Published by SPIE

Volume 11612

Proceedings of SPIE 0277-786X, V. 11612

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 Advances in Patterning Materials and Processes XXXVIII, edited by Daniel P. Sanders, Douglas Guerrero, Proceedings of SPIE Vol. 11612 (SPIE, Bellingham, WA, 2021) Seven-digit Article CID Number.

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510640573

ISBN: 9781510640580 (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

Copyright © 2021, 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/21/\$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.



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

	KEYNOTE SESSION
11612 05	Nano-scale effects of selective spin-on deposition [11612-3]
	RESIST CHEMISTRY: JOINT SESSIONS WITH CONFERENCES 11609 AND 11612
11612 07	Improved non-CAR type hemicellulose resists for EUV lithography [11612-5]
	MOR AND INFILTRATION METHODS: JOINT SESSIONS WITH CONFERENCES 11609 AND 11612
11612 08	Development of metal-organic cluster based negative tone resist: pre-screened through the helium-ion beam prelude to extreme ultraviolet lithography (EUVL) applications [11612-7]
11612 09	Preventing method of volume expansion of polymer after metal infiltration [11612-8]
11612 0A	Hybrid resist synthesis by ex-situ vapor-phase infiltration of metal oxides into conventional organic resists [11612-9]
	RESIST FUNDAMENTALS
11612 0C	Probing ion diffusion in chemically amplified resists through experiments and atomistic simulations [11612-11]
11612 0D	Fundamental study of polymer dynamic behavior in resist processing [11612-12]
11612 OE	Chemistry working for lithography: the Marangoni-effect-based single layer for enhanced planarization [11612-39]
	UNDERLAYERS AND DEFECT REDUCTION
11612 OF	Reducing the absorbance of a high etch resistant spin-on carbon hardmask [11612-15]
116120G	Development of metal purifiers specific to lithography materials [11612-17]
11612 OH	High performance filtration for bulk materials: a novel HDPE membrane filter designed for EUV lithography [11612-19]

NOVEL RESIST CONCEPTS AND TRACK PROCESSES

1161201	Multidimensional process optimization of a negative e-beam photoresist for silicon-waveguide manufacturing [11612-20]
11612 OJ	Highly fluorinated alternating copolymers possessing high glass transition temperature and cross-linking capabilities under extreme UV radiation [11612-21]
11612 OL	EUV resist performance enhancement by UV flood exposure for high NA EUV lithography [11612-23]
11612 OM	EUV lithographic process enablement with novel litho track hardware [11612-24]
	DSA
11612 ON	Self-aligned double pattern process using DSA pattern [11612-25]
1161200	Top-coats for scalable nano-manufacturing with high- χ block copolymers in lithographic applications [11612-26]
11612 0Q	Spatial arrangement of block copolymer nanopatterns using photoactive homopolymer substrates [11612-29]
	POSTER SESSION
11612 OR	Analysis of dissolution kinetics of poly(4-hydroxystyrene) with different molecular weight distributions in alkaline aqueous solution using machine learning [11612-30]
11612 0\$	Next generation purification method for achieving low trace metals in ultra-high purity chemicals [11612-31]
11612 OT	EUV defect reduction activities using coater/developer and etching technique [11612-32]
11612 OU	High contact angle embedded barrier layer materials for next-generation 193 immersion lithography [11612-33]
11612 OV	Enabling EUV pattern transfer by optimized under layer [11612-34]
11612 OW	Sequential infiltration synthesis and pattern transfer using 6 nm half-pitch carbohydrate-based fingerprint block copolymer [11612-35]
11612 0X	Optimization of point-of-use filtration for metal oxide photoresist [11612-36]
11612 10	Modeling the acid-catalyzed cleavage of carbon-oxygen bonds [11612-38]