New Biocides Development



Library of Congress Cataloging-in-Publication Data

New biocides development: the combined approach of chemistry and microbiology / Peter C. Zhu, editor.

p. cm.—(ACS symposium series; 967)

Includes bibliographical references and index.

ISBN 978-0-8412-7405-1 (alk. paper) (OP) ISBN 978-1-7138-8950-2 (pod)

- 1. Antiseptics—Congresses. 2. Bactericides—Congresses. 3. Antibacterial agents—Congresses. 4. Disinfection and disinfectants—Congresses.
 - I. Zhu, Peter C., 1957-

RM400.N49 2007 616.9'.201—dc22

2007060678

The paper used in this publication meets the minimum requirements of American National Standard for Information Sciences—Permanence of Paper for Printed Library Materials, ANSI Z39.48–1984.

Copyright © 2007 American Chemical Society

Distributed by Oxford University Press

All Rights Reserved. Reprographic copying beyond that permitted by Sections 107 or 108 of the U.S. Copyright Act is allowed for internal use only, provided that a per-chapter fee of \$36.50 plus \$0.75 per page is paid to the Copyright Clearance Center, Inc., 222 Rosewood Drive, Danvers, MA 01923, USA. Republication or reproduction for sale of pages in this book is permitted only under license from ACS. Direct these and other permission requests to ACS Copyright Office, Publications Division, 1155 16th Street, N.W., Washington, DC 20036.

The citation of trade names and/or names of manufacturers in this publication is not to be construed as an endorsement or as approval by ACS of the commercial products or services referenced herein; nor should the mere reference herein to any drawing, specification, chemical process, or other data be regarded as a license or as a conveyance of any right or permission to the holder, reader, or any other person or corporation, to manufacture, reproduce, use, or sell any patented invention or copyrighted work that may in any way be related thereto. Registered names, trademarks, etc., used in this publication, even without specific indication thereof, are not to be considered unprotected by law.

PRINTED IN THE UNITED STATES OF AMERICA

Contents

Prefacexi	
	General
1.	Effects of Environmental Chemicals and the Host-Pathogen Relationship: Are There Any Negative Consequences for Human Health?
2.	Disinfection and Sterilization in Healthcare Facilities31 Martin S. Favero
	Prioncides
3.	Disinfection of Prions52
J.	Kurt Giles, Surachai Supattapone, David Peretz, David V. Glidden, Henry Baron, and Stanley B. Prusiner
4.	Strategies for Inactivating Prions
	Biocides for Biofilms
5.	Biofilms and Biocides: Growing Consistent Monoculture Biofilms for Biocide Assessment92 T. Reg. Bott
6.	Topical Antimicrobials124 Daryl S. Paulson

New Biocide Synthesis

7.	Preparation of Phthalaldehydes by Hydrolysis of Aromatic gem-Tetrabromides152
	Peter Zhu, Kaitao Lu, and Der-Haw Wang
	Mechanisms and Structure-Activity Relationship
8.	Efficacy and Mycobactericidal Action of Aldehydes: Structure— Activity Relationship
9.	ortho-Phthalaldehyde: Mechanisms of Action against Mycobacteria182 Charles G. Roberts and Chris R. French
10.	The Jekyll and Hyde Roles of Cysteine Derivatives during Oxidative Stress
11.	Identification Strategy of Mechanism-Based Lipophilic Antimicrobials
12.	Where Old Biocides Meet New Biocides: Hypohalite Defense Factors of the Human Oral Cavity269 Michael T. Ashby
	Oxidizing Biocides
13.	Peroxygens and Other Forms of Oxygen: Their Use for Effective Cleaning, Disinfection, and Sterilization292 Gerald McDonnell
14.	Electrolyzed Water: Principles and Applications309 Yi-Cheng Su, Chengchu Liu, and Yen-Con Hung
15.	Use of Mannitol Hydrogen Peroxide to Control Microbial Produced Skin Irritants323 David W. Koenig and Benard J. Minerath

16.	Micrology and Chemistry of ortho-Phthalaldehyde336 J. M. Ascenzi, H. Chan-Myers, and M. D. Gordon
	Aldehyde Biocides
17.	Increasing Disinfection Efficacy of Glutaraldehyde via Chemical and Physical Enhancement
	Naturally Occurring Biocides
18.	Natural Antimicrobials from Plant Essential Oils364 Rong Tsao and Ting Zhou
19.	Antibacterial Actions of Ginkgolic Acids and Related Mechanisms
	Boron-Derivative Biocides
20.	Antimicrobial Properties of Boron Derivatives412 Olga Borokhov and David Schubert
	Biocide Comparison Studies
21.	Comparison of Mycobacterial Susceptibilities to Six Chemical Disinfectants
22.	A Comparison of the Microbicidal Efficacy on Germ Carriers of Several Tertiary Amine Compounds versus OPA and Perasafe
	Indexes
Autl	or Index473
Subj	ect Index475