

Biotechnology for Odor and Air Pollution Control

Zarook Shareefdeen • Ajay Singh (Eds.)

Biotechnology for Odor and Air Pollution Control

With 70 Figures

 Springer

DR. ZAROOK SHAREEFDEEN

BIOREM Technologies Inc.
Research and Development
7496 Wellington Road 34
Guelph, ON N1H 6H9
Canada

e-mail:
zshareefdeen@bioremtech.com

DR. AJAY SINGH

Petrozyme Technologies Inc.
7496 Wellington Road 34
Guelph, ON N1H 6H9
Canada

Department of Biology
University of Waterloo
Waterloo, ON N2L 3G1
Canada

e-mail:
asingh@petrozyme.com
ajasingh@sciborg.uwaterloo.ca

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Preface

Volatile organic and inorganic odorous compounds from various industries are emitted in large quantities and create hazards to the ecosystem and health effects to humans. The need for odor and air pollution control is driven by regulatory issues, generally enforced as a result of public complaints about poor local air quality and through emission monitoring by the enforcement agencies. With increasing populations, and new residential and industrial developments, the demand for air pollution control systems that provide nuisance-free, breathable air is growing.

Biotechnology offers one of the most economical and environmentally benign methods of air pollution control for industrial and municipal airstreams. Bioprocess is becoming an effective alternative to traditional physical and chemical odor removal methods used in wastewater treatment plants, rendering plants, chemical production facilities, and food and flavor manufacturing facilities.

This book, *Biotechnology for Odor and Air Pollution Control*, covers not only the basic microbiological and engineering aspects of various bioreactors, but also describes the design, modeling, and control of such bioreactors for their unique applications in odor and air pollution management, and control in industrial facilities and wastewater treatment plants. Specific topics include methods of odor and volatile organic compound (VOC) control, regulatory issues, microbiological aspects of bioreactors, selection of bioreactor media, description and design of various bioreactors for odor and air pollution control, such as biofilter, biotrickling filter, bioscrubber and membrane bioreactor, and applications and case studies related to these technologies for the treatment of air contaminants in municipal and industrial plants, and future prospects of biotechnology for odor and air pollution control.

The contributing authors are applied and industrial researchers from diverse backgrounds: universities, research institutes, and industries. They are experts in biological methods for odor and air pollution control. This book will be a valuable reference tool for graduate students, scientists, industrial consultants, biotechnologists, microbiologists, and chemical, biochemical, environmental and civil engineers who are interested in environmental sciences, and particularly, in innovative biological technologies for treatment and control of odor and air pollution. We hope that students, teachers, scientists and engineers, whether in academia, industry or government, will find the descriptive and practical contents of this book interesting and helpful.

We are grateful to all the authors for their excellent contributions. Several of our colleagues provided encouragement and help during the various stages of this editorial work. Continuous support and guidance provided by Dr. Jutta Lindenborn, Springer, during the preparation of this book is highly appreciated.

Guelph, Ontario, May 2004

Zarook Shareefdeen and Ajay Singh

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Contributors

Aldrich, R.L., Sterling Environmental Engineering, P.C., 24 Wade Road, Latham, New York 12110, USA

Allen, D.G., Department of Chemical Engineering and Applied Chemistry, and Pulp & Paper Centre, University of Toronto, 200 College Street, Toronto, Ontario M5S 3E5, Canada

Andrès, Y., Ecole des Mines de Nantes, 4 rue Alfred Kastler, B.P. 20 722, 44307 Nantes Cedex 03, France

Bina, A., Department of Civil and Environmental Engineering, University of Southern California, Los Angeles, California 90089-2531, USA

Cudmore, R., Aurora Pacific Ltd., Christchurch, New Zealand

Datta, I., Department of Chemical Engineering and Applied Chemistry, and Pulp & Paper Centre, University of Toronto, 200 College Street, Toronto, Ontario M5S 3E5, Canada

Deshusses, M.A., Department of Chemical and Environmental Engineering, University of California, Riverside, California 92521, USA

Devinny, J.S., Department of Civil and Environmental Engineering, University of Southern California, Los Angeles, California 90089-2531, USA

Fitch, M.W., Department of Civil, Architectural and Environmental Engineering, University of Missouri-Rolla, Rolla, Missouri 65409, USA

Gabriel, D., Escola Tecnica Superior d'Enginyeria, Universitat Autònoma de Barcelona, Bellaterra, Barcelona 08193, Spain

Gérente, C., Ecole des Mines de Nantes, 4 rue Alfred Kastler, B.P. 20 722, 44307 Nantes Cedex 03, France

Gostomski, P., Department of Chemical & Process Engineering, University of Canterbury, Christchurch, New Zealand

Govind, R., Department of Chemical Engineering, Mail Location 171, University of Cincinnati, Cincinnati, Ohio 45221-0171, USA

Herner, B., BIOREM Technologies, 7496 Wellington Road 34, Guelph, Ontario N1H 6H9, Canada

Kraakman, B., BIOWAY bv, Rubensstraat 187, 6717 VE Ede, Postbus 361, 6710 BJ Ede, The Netherlands

Le Cloirec, P., Ecole des Mines de Nantes, 4 rue Alfred Kastler, B.P. 20 722, 44307 Nantes Cedex 03, France

Mohseni, M., Department of Chemical & Biological Engineering, University of British Columbia, 2216 Main Mall, Vancouver, British Columbia V6T 1Z4, Canada

Morgan-Sagastume, J.M., Environmental Bioprocesses Department, Engineering Institute, Universidad Nacional Autónoma de México (UNAM), Apdo. Postal 70-472, 04510 Mexico D.F., Mexico

Narayan, S., Department of Chemical Engineering, Mail Location 171, University of Cincinnati, Cincinnati, Ohio 45221-0171, USA

Ozis, F., Department of Civil and Environmental Engineering, University of Southern California, Los Angeles, California 90089-2531, USA

Popov, V., A.N. Bakh Institute of Biochemistry, Russian Academy of Sciences, Leninskiy pr. 33, 117071 Moscow, Russia

Pré, P., Ecole des Mines de Nantes, 4 rue Alfred Kastler, B.P. 20 722, 44307 Nantes Cedex 03, France

Revah, S., Department of Process Engineering, Universidad Autónoma Metropolitana-Iztapalapa (UAM-I), Apdo. Postal 55-534, 09340 Mexico D.F., Mexico

Shareefdeen, Z., BIOREM Technologies, 7496 Wellington Road 34, Guelph, Ontario N1H 6H9, Canada

Singh, A., Petrozyme Technologies, 7496 Wellington Road 34, Guelph, Ontario N1H 6H9, Canada

Ward, O., Department of Biology, University of Waterloo, Waterloo, Ontario N2L 3G1, Canada

Webster, T.S., Shaw Environmental, Inc., 1230 Columbia Street, Suite 1200, San Diego, California 92101-8517, USA

Zhukov, V., A.N. Bakh Institute of Biochemistry, Russian Academy of Sciences, Leninskiy pr. 33, 117071 Moscow, Russia

Part I

Introduction and Basic Theory