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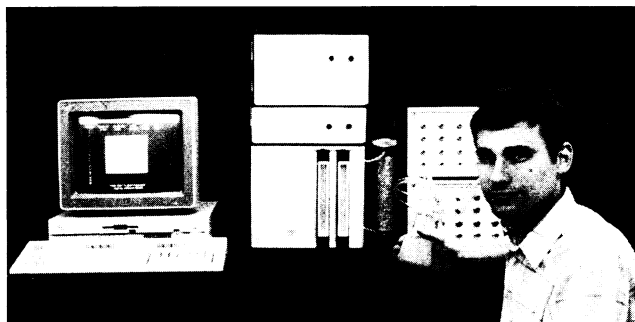
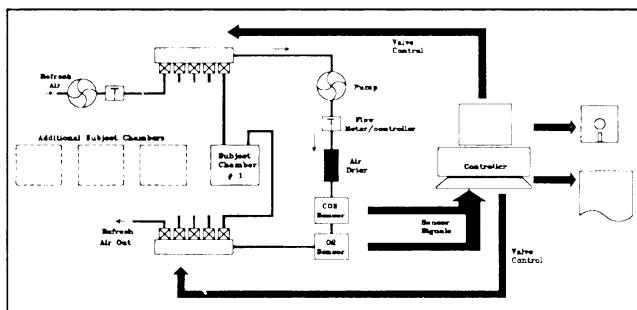
O₂/CO₂ RESPIROMETER

for Waste Bioremediation, Oxidation, Bioactivity and Food Technology

The Micro-Oxymax is a closed-circuit respirometer used to measure minute amounts of oxygen consumption and carbon dioxide production. External gas sensors measure the O₂ and CO₂ concentrations within the head space of the measurement vessel and this information is used to calculate O₂ consumption and CO₂ production. The Micro-Oxymax measures up to 20 samples at the same time, sequentially switching the gas sensors from one measuring vessel to the next. The head space gas in the measuring vessel is returned to the vessel after being analyzed by the sensors.

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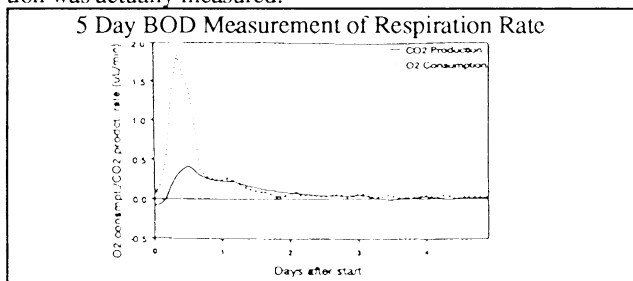
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APPLICATION: BOD Measurement (Biochemical Oxygen Demand)

The Micro-Oxymax can be used to measure the total O₂ uptake and CO₂ production from the bacterial breakdown of waste. In the following experiment, a solution containing 5 mg sodium acetate is broken down over 5 days.

The graph below shows the O₂ consumption rate and the CO₂ production rate of the BOD sample minus the O₂ consumption rate and the CO₂ production rate of the control sample. After two days, most of the breakdown of the organics had already taken place. In theory, a total of 1645 μL of O₂ would have been expected to have been consumed, whereas 1424 μL O₂ consumption was actually measured.

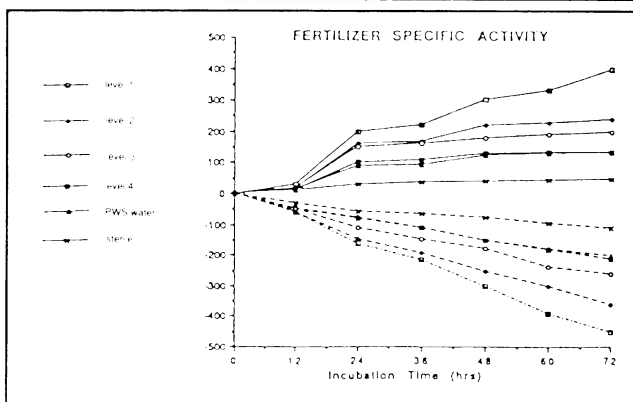


Biodegradation of Crude Oil

Oiled beach material was collected from Passage Cove (PC) and Disk Island (DI) in Prince William Sound, Alaska. Samples, packed with dry ice, were transported to the Gulf Breeze Environmental Research Laboratory at Gulf Breeze, Florida or processed at the laboratory in Valdez, Alaska. Beach material was sieved (<12.5 mm diam, >2.75 mm diam) and mixed to generate an homogenized substrate of uniform size and degree of oiling (0.4% [weight] Prudhoe Bay crude oil).

Indigenous, oil-degrading microorganisms associated with the beach material were treated with one of the following inorganic nutrient solutions: level 1 35.7 mmol N as NH₄NO₃ (350 ppm N) and 8.07 mmol P as KH₂PO₄ (70 ppm P), level 2 35 ppm N and 7 ppm P, level 3 3.5 ppm N and 0.7 ppm P or level 4 0.35 ppm N and 0.07 ppm P. Effects of nitrogen (35.7 mmol) or phosphorus (8.07 mmol) alone were also evaluated. Sterile nutrient solutions were prepared with water from Prince William Sound (PWS), Alaska. Daily treatments were applied at each high-tide, or once at the initial high-tide. Results were compared with those observed with high-tide solutions of filtered PWS water, or 3% NaCl in distilled water (pH=8.1). A sterile, killed cell control was prepared using an acidified PWS water as the high-tide solution.

The graph below summarizes results typical of those generated throughout the past 2 years. Here, addition of the high-level nutrient solution (level 1) resulted in a 2- to 3-fold increase in the activity of the oil-degrading population as determined by the release of CO₂ and the consumption of O₂. As expected, the ratio of CO₂ production to O₂ consumption is nearly 1.0. The stimulatory effect of inorganic nutrients was shown to be directly proportional to the amount of nutrient added to the test systems. (Information provided by Dr. James G. Mueller, US EPA Gulf Breeze, Florida)



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PSEUDOMONAS: Molecular Biology and Biotechnology

Edited by **Enrica Galli**, *University of Milan, Milan, Italy*; **Simon Silver**, *University of Illinois, Chicago*; and **Bernard Witholt**, *University of Groningen, Groningen, The Netherlands*

A summary of current research on an important bacterial genus and a signpost for trends in the development of modern microbiology

PUBLISHED by ASM in cooperation with the Federation of European Microbiological Societies (FEMS), this new book gathers and summarizes the latest developments in international research on *Pseudomonas* species. The contributors are representative of the science from many countries. Areas of emphasis include the molecular biology, biotechnological and industrial applications, and involve-

Pseudomonas

Molecular Biology and Biotechnology



Edited by
Enrica Galli,
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Bernard Witholt

ment in human and plant pathogenesis of pseudomonads. Chapters expand on the initial presentations of world experts at the Third International Symposium (Trieste, Italy, June 1991). These contents will be important for anyone interested in the various abilities and uses for pseudomonads. Students and workers concentrating on related groups of bacteria who need to understand how modern microbiology is developing,

including such controversial topics as environmental release of genetically engineered microorganisms, will find this book a useful signpost.

CONDENSED CONTENTS

Pseudomonas in the Late Twentieth Century (B. W. Holloway); A Common System of Nomenclature for the Physical Map of the Chromosome of *Pseudomonas aeruginosa* PAO (Tümmler et al.)

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Part 4. Cell Envelope and Transport (5 chapters by Feingold, Nikaïdo, Quinn, Coleman et al., and Bellido et al.)

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Part 9. Environmental Release (4 chapters by Lindow, Dowling et al., de Lorenzo and Timmis, and Duque et al.)

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Bacteriological Code, 1990 Revision

Editors: S. P. Lapage, P. H. A. Sneath, E. F. Lessel, V. B. D. Skerman, H. P. R. Seeliger, and W. A. Clark: Editor for the 1992 Edition, P. H. A. Sneath

Published in 1992 by ASM for the International Union of Microbiological Societies (IUMS), the *Bacteriological Code, 1990 Revision*, is the only internationally recognized and approved reference book covering the rules and procedures for correct bacterial nomenclature. This new edition substantially updates the previous *Code*, published in 1975, by incorporating all subsequent additions and modifications which have occurred from 1976 through September 1990. Underlying this effort is the belief that progress in bacteriology is furthered by a precise and internationally recognized system of nomenclature.

Of interest to bacteriologists in general, microbiologists working in systematics, some biochemists and molecular biologists, and taxonomists in particular, this reference is the best available resource for the scientist seeking to assess the correctness of names applied to defined bacterial taxa or to create and propose new names for formal approval. Here also is a summary of the history of the *Code* and lists of conserved and rejected names.

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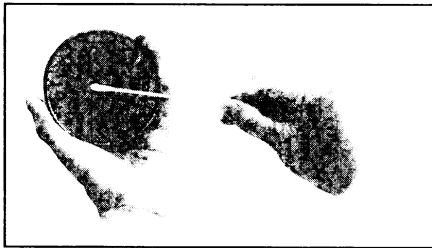
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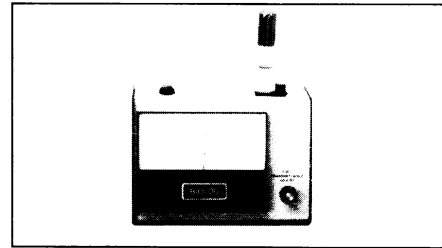
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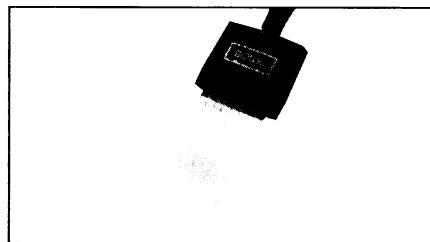
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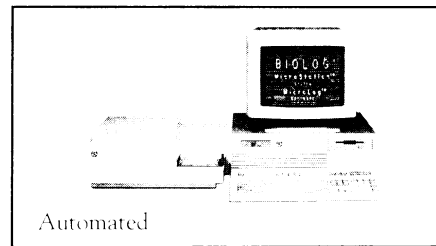
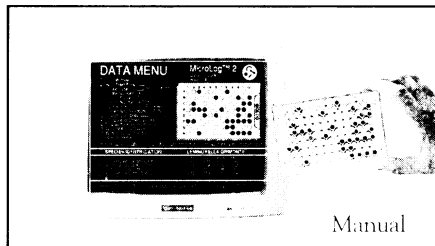
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