

66 / 48538

Volume 17 Number 1 1985
Water Science and Technology

ANAEROBIC TREATMENT OF FOREST INDUSTRY WASTEWATERS

Editors: P. RANTALA and A. LUONSI



INTERNATIONAL ASSOCIATION
ON WATER POLLUTION
RESEARCH AND CONTROL

F1420.7

CONTENTS

Preface	vii
Wastewater Characteristics	
N.-E. VIRKOLA and K. HONKANEN: Wastewater characteristics	1
L. J. WEBB: Characteristics of paper/board mill wastewaters relevant to anaerobic treatment	29
G. ENDO and Y. TOHYA: Anaerobic biological decomposition of malodorous compounds in kraft pulping wastewater	39
Process	
R. K. MÄÄTTÄ: Anaerobic wastewater treatment processes	53
L. H. A. HABETS and J. H. KNELISSEN: Application of the UASB-reactor for anaerobic treatment of paper and board mill effluent	61
M. S. SALKINOJA-SALONEN, R. HAKULINEN, L. SILAKOSKI, J. APAJALAHTI, V. BACKSTRÖM and E.-L. NURMIAHO-LASSILA: Fluidized bed technology in the anaerobic treatment of forest industry wastewaters	77
L. VAN DEN BERG, K. J. KENNEDY and R. SAMSON: Anaerobic downflow stationary fixed film reactors: Performance under steady state and non-steady state conditions	89
T. WELANDER and P.-E. ANDERSSON: Anaerobic treatment of wastewater from the production of chemi-thermomechanical pulp	103
Case Studies	
J. F. FERGUSON and M. M. BENJAMIN: Studies of anaerobic treatment of sulfite process wastes	113
C. J. PRIEST: Operational experience with anaerobic/aerobic treatment system for paper mill wastewater	123
S. REKUNEN, O. KALLIO, T. NYSTRÖM and O. OIVANEN: The TAMAN anaerobic process — for wastewater from mechanical pulp and paper production	133
H. KROISS, K. SVARDAL and H. FLECKSEDER: Anaerobic treatment of sulfite pulp mill effluents	145
A. GELLER and L. GÖTTSCHING: Anaerobic fermentation of sulphite pulp mill effluents	157

Process Control

B. FROSTELL: Process control in anaerobic wastewater treatment	173
M. DOHÁNYOS, B. KOSOVÁ, J. ZÁBRANSKÁ and P. GRAU: Production and utilization of volatile fatty acids in various types of anaerobic reactors	191
A. AIVASIDIS: Anaerobic treatment of sulfite evaporator condensate in a fixed bed loop reactor	207
P. K. LATOLA: Treatment of different wastewaters from pulp and paper industry in methane reactors	223
H. KROISS, F. PLAHL-WABNEGG and K. SVARDAL: Anaerobic treatment of viscose wastewater	231

Costs

G. K. ANDERSON and A. U. SENARATNE: Costs of anaerobic processes in the pulp and paper industry	241
P. RANTALA and P. VÄÄNÄNEN: Cost comparison of aerobic and anaerobic wastewater treatment systems	255

Development and Microbiology

J. ORIVUORI: Forest industry anaerobic wastewater treatment and its future development	265
L. GUNNARSSON and B. ROSÉN: Anaerobic treatment of sulphite evaporator condensate in a pilot plant of novel design	271
J. A. PUHAKKA, J. A. RINTALA and P. VUORIRANTA: Influence of sulfur compounds on biogas production from forest industry wastewater	281
R. HAKULINEN, S. WOODS, J. FERGUSON and M. BENJAMIN: The role of facultative anaerobic micro-organisms in anaerobic biodegradation of chlorophenols	289

Posters

J. ZÁBRANSKÁ, M. DOHÁNYOS and P. GRAU: Direct measurement of the hydrogenase activity of anaerobic microorganisms	303
H. KROISS and K. SVARDAL: Anaerobic treatment of fibre board mill wastewater	307
P. J. VUORIRANTA, J. A. RINTALA and H. KIRJAVAINEN: Sludge characteristics in UASB-reactor treating thermomechanical pulping effluents	313
O. KUUSINEN: New domestic renewable energy through the high technology of biogases	317
Concluding remarks of the symposium	321
Subject index	323
New patents	ix

Water Science and Technology

ANAEROBIC TREATMENT OF FOREST INDUSTRY WASTEWATERS

Proceedings of the First IAWPRC Symposium on Forest Industry Wastewaters held in Tampere, Finland, 11-15 June, 1984

In this publication the proceedings of the first IAWPRC symposium on Forest Industry Wastewaters are presented. The forestry industry is a major source of water pollution in countries producing pulp and paper, and treatment of this wastewater needs to be achieved both economically and efficiently. The application of the anaerobic process, which has been shown to have distinct advantages over conventional wastewater treatment in certain situations, has generated growing interest.

This symposium enabled the exchange of views and experiences on *Anaerobic Treatment of Forest Industry Wastewaters* and was a forum for the presentation of the latest research efforts in this field. The proceedings are organised into six sections: Wastewater characteristics; Process; Case studies; Process control; Costs; Development and microbiology. Each section comprises an invited overview paper followed by several related articles. These proceedings also include the summaries of posters presented at the symposium.

464
ISSN 0273-1223
ISBN 0 08 032729 X
WSTED4 17(1) 1-326 (1985)