

BIOGAS PRODUCTION
FROM POULTRY MANURE WASTEWATER
USING SOIL MIXED CULTURE

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BIOGAS PRODUCTION FROM POULTRY MANURE WASTEWATER
USING SOIL MIXED CULTURE

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Thesis submitted in fulfillment of the requirements
for the award of the degree of
Master of Engineering (Bioprocess)

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TABLE OF CONTENTS

	Page
SUPERVISOR'S DECLARATION	ii
STUDENT'S DECLARATION	iii
DEDICATION	iv
ACKNOWLEDGEMENTS	v
ABSTRACT	vi
ABSTRAK	vii
TABLE OF CONTENTS	viii
LIST OF TABLES	xi
LIST OF FIGURES	xii
LIST OF ABBREVIATIONS	xiv
CHAPTER 1 INTRODUCTION	
1.1 Research overview	1
1.2 Problem statement	3
1.3 Objectives	4
1.4 Scope of study	4
1.5 Organization of the thesis	5
CHAPTER 2 LITERATURE REVIEW	
2.1 Introduction	7
2.2 Biogas production	8
2.2.1 Substrates for biogas production	10
2.2.2 Treatment of poultry manure wastewater	13
2.3 Inoculum for biogas production	15
2.4 Important factors affecting biogas production	16
2.5 Utilization of response surface method (RSM)	18
2.5.1 Two-level factorial design (TFD) for factorial analysis	20
2.5.2 Central composite design (CCD) for process optimization	21
2.6 Chapter summary	23

CHAPTER 3 MATERIALS AND METHODS

3.1	Flow of methodology	24
3.2	Poultry manure wastewater	26
3.2.1	Collection of poultry manure	26
3.2.2	Preparation of poultry manure wastewater	26
3.3	Treatment of poultry manure wastewater	26
3.3.1	Collection of soils	26
3.3.2	Characterization of soils	26
3.3.3	Preparation of soil water	27
3.3.4	Preliminary study	27
3.3.5	Experimental design	28
3.3.6	Experimental set up for treatment	28
3.3.7	Analysis for treatment	28
3.4	Biogas production from PMW	31
3.4.1	Collection of soil	31
3.4.2	Characterization of substrates	31
3.4.3	Preparation of soil mixed culture	32
3.4.4	Acclimatization of soil mixed culture	32
3.4.5	Preliminary study	33
3.4.6	Experimental design for factorial analysis by using TFD	33
3.4.7	Experimental set up for factorial analysis	34
3.4.8	Experimental design for process optimization by using CCD	37
3.4.9	Experimental set up for process optimization	37
3.4.10	Analysis for biogas production	38
3.4.11	Validation of optimum condition	39
3.5	Application of treatment to biogas production	40

CHAPTER 4 RESULT AND DISCUSSION

4.1	Characterization of soils and poultry manure wastewater (PMW)	41
4.1.1	Characterization of soils	41
4.1.2	Characterization of poultry manure wastewater (PMW)	44

4.2	Treatment of PMW	47
4.2.1	Preliminary study	47
4.2.2	Statistical analysis for treatment	48
4.2.3	Main effect analysis	51
4.2.4	Interactions between factors	53
4.3	Biogas production of PMW	55
4.3.1	Statistical analysis for factorial analysis	55
4.3.2	Main effect analysis for factorial analysis	58
4.3.3	Interaction between factors in factorial analysis	60
4.3.4	Statistical analysis for process optimization	61
4.3.5	Interaction between factors in process optimization	65
4.3.6	Validation of suggested optimum condition	66
4.4	Application of treatment to biogas production	67

CHAPTER 5 CONCLUSION AND RECOMMENDATION

5.1	Characterization of soils and poultry manure wastewater (PMW)	69
5.2	Treatment of poultry manure wastewater	70
5.3	Factorial analysis of poultry manure wastewater	70
5.4	Process optimization of poultry manure wastewater	71
5.5	Recommendations	71
5.5.1	Using bio-reactor with sensor and data logger	71
5.5.2	The mechanism of biogas production from PMW	71
5.5.3	Kinetic study of biogas production from PMW	72

REFERENCES

APPENDICES

A.	Supporting details	88
B.	Experimental procedures and data	89
C.	List of publications	128

LIST OF TABLES

Table no.	Title	Page
2.1	General features of biogas	9
2.2	Biogas yield from different type of substrates	11
2.3	Strength of correlation	19
3.1	Summary of test method for soils characterization	27
3.2	Ranges of factors for PMW treatment	28
3.3	Experimental table for PMW treatment (actual factor)	29
3.4	Experimental table for PMW treatment (coded value)	30
3.5	Test method for characterization of PMW and treated PMW	31
3.6	Ranges of factors for factorial analysis	33
3.7	Experimental table for factorial analysis (actual factor)	34
3.8	Experimental table for factorial analysis (coded value)	35
3.9	Ranges of factors for process optimization	37
3.10	Experimental table for process optimization (actual factor)	37
3.11	Experimental table for process optimization (coded value)	38
3.12	Suggested optimum conditions for process optimization	39
4.1	Characteristics of soils	44
4.2	Soil textures analysis	44
4.3	Characteristics of PMW and treated PMW	47
4.4	Result of preliminary study	47
4.5	Ranges of factors for treatment	49
4.6	Analysis of variance for treatment of PMW	49
4.7	Strength of correlation	50
4.8	Experimental result for treatment of PMW (coded value)	50
4.9	Percentage contribution of each main factor and interactions	53
4.10	Ranges of factors for factorial analysis	56
4.11	Experimental result for factorial analysis (coded value)	56
4.12	Analysis of variance for factorial analysis	57
4.13	The percentage contribution of each factor and their interaction	60
4.14	Ranges of factors for process optimization	62

4.15	Experimental results for process optimization (coded value)	63
4.16	Analysis of variance for process optimization	63
4.17	Suggested optimum conditions for process optimization	67

LIST OF FIGURES

Figure no.	Title	Page
1.1	Energy demand in Malaysia, MTOE	2
2.1	Anaerobic digestion process	9
2.2	Response surface plot	20
3.1	Process flow chart	25
3.2	Experimental set up for biogas production	36
4.1	The interaction graph between factors agitation (A) and reaction time (B)	54
4.2	The interaction graph between type of soil water (C) and soil: water (D)	55
4.3	The interaction graph between factors agitation (A) and process system (D)	61
4.4	Interaction graph between factors substrate: inoculum (C) and type of substrate (E)	61
4.5	Model graph of process optimization	64
4.6	Interaction graph of process optimization	66
4.7	Biogas yield graph	68

LIST OF SYMBOLS

α	Distance from the centre point of the design
β_0	Intercept
β_1	Linear coefficients
β_2	Linear coefficients
β_{11}	Quadratic coefficients
β_{22}	Quadratic coefficients
β_{12}	Logarithmic coefficient
$^{\circ}\text{C}$	Degree celsius
%	Percent
\pm	Plus minus

LIST OF ABBREVIATIONS

AN	Ammoniacal nitrogen
ANN	Artificial Neural Network
ANOVA	Analysis of variance
BOD	Biological oxygen demand
C	Carbon
CCD	Central composite design
CEC	Cations exchange capacity
CHP	Combine heat and power
CO ₂	Carbon dioxide
CH ₄	Methane
COD	Chemical oxygen demand
CSTR	Continuous stirred tank reactor
d	day
DI	Distilled water
DF	Degree of freedom
DOE	Design of experiment
F/M	Food to microorganism
F-value	Fishers test value
h	hour
HRT	hydraulic retention time
g	gram
GA	Genetic Algorithm
m	meter
mm	millimeter
ml	mililiter
m ³	meter cubic
m.t	metric tonnes
mg	milligram
kg	kilogram
kWh	kilowatt per hour
kmol	kilo mol

L	Liter
N	Nitrogen
MC	Moisture content
OFAT	One-factor-at-a-time
P	Phosphorus
PMW	Poultry manure wastewater
POME	Palm oil mill effluent
PFS	Poultry farm soil
PFW	Poultry farm soil water
PSL	Poultry soil
p-value	Probability value
R ²	Coefficient of determination
R1	Response
Rpm	Revolution per minute
RSM	Response surface method
SMC	Soil mixed culture
SS	Sandy soil
SSPS	Statistical Package for the Social Sciences SPSS
SSW	Sandy soil water
SW	Soil water
TFD	Two-level factorial design
TJ	Terajoule
TS	Total solid
UMP	Universiti Malaysia Pahang
USA	United States of America
VS	Volatile solid
y	year