

OPTIMIZATION OF INTERFACIAL POLYMERIZATION THIN FILM
COMPOSITE MEMBRANE FOR SEPARATION OF XYLOSE FROM GLUCOSE

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TABLE OF CONTENTS

DECLARATION

TITLE PAGE	i
ACKNOWLEDGEMENTS	ii
ABSTRACT	iii
ABSTRAK	iv
TABLE OF CONTENTS	v
LIST OF FIGURES	ix
LIST OF TABLES	xi
LIST OF SYMBOLS	xiii
LIST OF ABBREVIATIONS	xiv

CHAPTER 1 INTRODUCTION

1.1	Background	1
1.2	Problem Statement	2
1.3	Research Objective	5
1.4	Research Scope	5

CHAPTER 2 LITERATURE REVIEW

2.1	Lignocellulose Biomass	7
2.2	Separation of Xylose from Glucose	8
2.3	Membrane Processes	9
2.4	Nanofiltration	10
2.5	Nanofiltration Membrane Structure	12
2.6	Nanofiltration Membrane Fabrication	14
2.6.1	Phase Inversion Process	14
2.6.1.1	Immersion Precipitation	15
2.6.1.2	Evaporation-Induced Phase Separation	16
2.6.2	Interfacial Polymerization	17

2.6.3	Grafting Polymerization	18
2.6.4	Layer-by-Layer Deposition	18
2.7	Factors in Interfacial Polymerization	19
2.7.1	Type of Support Membrane	19
2.7.2	Type of Monomers	20
2.7.3	Concentration of Monomers	25
2.7.4	Interfacial Polymerization Reaction Time	26
2.7.5	Aqueous Solution pH	27
2.7.6	Curing Process	27
2.8	Predictive Modelling	31
2.9	Design of Experiment	34
2.9.1	Factorial Analysis	35
2.9.2	Optimization Design	36

CHAPTER 3 METHODOLOGY

3.1	Introduction	38
3.2	Materials	39
3.3	Preparation of TFC Membrane	40
3.4	Membrane Characterization	41
3.4.1	Attenuated Total Reflection Fourier Transform Infrared Spectroscopy	41
3.4.2	Field Emission Scanning Electron Microscope Analysis	42
3.4.3	Contact Angle Measurement	42
3.4.4	Pore Size Determination	42
3.5	Nanofiltration Set-up and Permeation Tests	44
3.6	Quantification of Sugar Using HPLC	48
3.7	Factorial Analysis on Interfacial Polymerization	49
3.8	A Study on the Curing Time and Its Performance Evaluation	52
3.9	Factors Optimization in Interfacial Polymerization	53
3.10	Validation Experiments	56

CHAPTER 4 RESULT AND DISCUSSION

4.1	Thin-Film Composite Nanofiltration Membrane Characterization	57
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4.1.1	Attenuated Total Reflection Fourier Transform Infrared Spectroscopy Analysis	59
4.1.2	Field Emission Scanning Electron Microscope Analysis	60
4.1.3	Contact Angle	62
4.1.4	Pure Water Permeability	63
4.1.5	Membrane Fouling	64
4.2	Factorial Analysis on Interfacial Polymerization	65
4.2.1	Pore Size and Effective Membrane Thickness/porosity	65
4.2.2	Model Fitting and Effect Estimation	67
4.2.3	ANOVA	69
4.2.4	Effect of Main Factors on Xylose Separation Factor	71
4.2.5	Validation of Model	72
4.3	Effect of Curing Time on the TFC NF Properties and Performance	73
4.3.1	Effect of Curing Time on Contact Angle and Xylose Separation Factor	73
4.3.2	Effect of Curing Time on Water Permeability, Water Flux, and Sugar Filtration Flux	74
4.3.3	Effect of Curing Time on Membranes' Pore Size and Effective Thickness/Porosity	76
4.4	Optimization on Interfacial Polymerization	79
4.4.1	Model Fitting	80
4.4.2	ANOVA	82
4.4.3	Effect of IP Conditions on Xylose Separation Factor	85
	4.4.3.1 Effect of Reaction Time and Curing Conditions	85
	4.4.3.2 Effect of Curing Time and Curing Temperature	88
4.4.4	Validation of Model	90
4.5	Comparison TFC Membrane in This Study with Commercial Nanofiltration Membrane and Other Self-Made TFC Membranes	91
 CHAPTER 5 CONCLUSION AND RECOMMENDATION		
5.1	Conclusion	94
5.2	Recommendations	96
REFERENCES		98

APPENDICES

A	r_p and $\Delta x/A_k$ Calculation	108
B	HPLC Standard Curves	120
C	Membrane Characteristics and Performance at Different Curing Times	121
D	List of Publications	122

LIST OF FIGURES

Figure	Title	Page
2.1	Classification of membrane processes	10
2.2	Summary of the most significant events, which have contributed to the development of NF, over time. Adapted from Marchetti et al. (2014)	12
2.3	Types of membrane structure	13
2.4	Membrane taxonomy chart. Adapted from Marchetti et al. (2014)	14
2.5	Immersion precipitation in small scale	16
2.6	A typical hand casting knife	16
2.7	Sequence in IP	17
2.8	A representation of grafting process	18
3.1	Experimental workflow	39
3.2	Flow of preparing TFC membrane	41
3.3	Calculation steps to find the pore size and effective membrane/porosity	44
3.4	Schematic diagram of NF system	45
3.5	Sequence of NF experiment for sugar filtration	46
3.6	Sequence of NF fouling experiments	48
4.1	Possible polymerization reaction scheme between TEOA and TMC. Adapted from (Tang et al., 2008)	58
4.2	ATR-FTIR spectra for PES membrane and TFC membrane in overlay mode	59
4.3	FESEM surface images of (a) PES membrane and (b) TFC membrane at 10,000x magnification	61
4.4	FESEM cross-sectional image of (a) PES membrane and (b) TFC membrane at 5,000x magnification	62

4.5	Contact angle measurement for PES membrane and TFC membrane	63
4.6	Pure water permeability measurement for PES membrane and TFC membrane	64
4.7	Normalized relative flux of membrane during sugar filtration	65
4.8	Pareto chart of effects of interfacial polymerization factors on xylose separation factor	69
4.9	Contact angle of membranes cured at different curing times	74
4.10	(a) Pure water permeability and (b) pure water flux at 4 bar for membranes cured at different curing times	75
4.11	Sugar filtration flux of membranes cured at different curing times	76
4.12	Effect of curing time on membranes' (a) pore size, r_p and (b) effective thickness/porosity, $\Delta x/A_k$	78
4.13	Predicted vs. actual xylose separation factor colored by standard order	84
4.14	(a) Three-dimensional response surface plot and (b) interaction graph for the effects of reaction time (A) and curing time (B) on xylose separation factor at a constant curing temperature (C) of 60 °C	86
4.15	(a) Three-dimensional response surface plot and (b) interaction graph for the effects of reaction time (A) and curing temperature (C) on xylose separation factor at a constant curing time (B) of 15 minutes	87
4.16	(a) Three-dimensional response surface plot and (b) interaction graph for the effects of curing time (B) and curing temperature (C) on xylose separation factor at a constant reaction time (A) of 45 minutes	89

LIST OF TABLES

Table	Title	Page
2.1	Properties of xylose and glucose	8
2.2	Summary of phase inversion	15
2.3	Commonly used and newly reported diamine monomers for TFC membrane preparation	22
2.4	Commonly used and newly reported diacid chloride monomers for TFC membrane preparation	23
2.5	Past studies on curing process in IP	29
2.6	Summary of NF membranes characteristic	32
3.1	List of equations for pore size and effective membrane thickness/porosity calculations	43
3.2	Factors and their designated low and high value	51
3.3	Experimental design matrix for screening	52
3.4	Levels of the curing condition variables tested in the CCD	54
3.5	Experimental design matrix for optimization	55
4.1	Experimental design and response for factorial analysis	66
4.2	Sum of squares and the percent contribution for each term	67
4.3	ANOVA analysis for the factorial model	70
4.4	Suggested best condition for factors in membrane preparation for maximizing xylose separation factor	70
4.5	Comparison between predicted and experimental value for best condition	72
4.6	Experimental design and response for optimization	80
4.7	Sequential model sum of squares	81
4.8	Lack of fit test	82
4.9	ANOVA analysis for the optimization model	83

4.10	Condition for factors in membrane preparation for optimizing xylose separation factor	90
4.11	Comparison between predicted and experimental value for optimum condition	91
4.12	Comparison between predicted and experimental value for optimum condition	92

LIST OF SYMBOLS

A	Effective membrane area (m^2)
C_b	Concentration of respective solute in bulk (g/100 g of solution)
C_{b_glu}	Concentration of glucose in the bulk (g/100 g of solution)
C_{b_xyl}	Concentration of xylose in the bulk (g/100 g of solution)
C_f	Concentration of respective solute in feed (g/100 g of solution)
C_p	Concentration of respective solute in permeate (g/100 g of solution)
C_{p_glu}	Concentration of glucose in permeate (g/100 g of solution)
C_{p_xyl}	Concentration of xylose in permeate (g/100 g of solution)
C_r	Concentration of respective solute in retentate (g/100 g of solution)
J_0	Pure water flux before filtration ($Lm^{-2} h^{-1}$)
J_f	pure water flux after filtration ($Lm^{-2} h^{-1}$)
J_v	Separation flux ($L m^{-2} h^{-1}$)
J_w	Water flux ($L m^{-2} h^{-1}$)
P_m	Pure water permeability ($L m^{-2} h^{-1} bar^{-1}$)
R^2	Coefficient of determination
R_{obs}	Observed retention of respective solute
r_p	effective pore radius (nm)
Δt	measured period of time for collection of ultrapure water (h)
ΔV	volume of ultrapure water collected (L)
X_{xyl}	xylose separation factor
$\Delta x/A_k$	ratio of effective membrane thickness over porosity (μm)

LIST OF ABBREVIATIONS

AFM	Atomic force microscopy
ANOVA	Analysis of variance
ATR	Attenuated total reflectance
CCD	Central composite design
DOE	Design of experiments
DSPM	Donnan-steric-pore model
EFBF	Empty fruit bunch fiber
FESEM	Field emission scanning electron microscope
FTIR	Fourier transform infrared
HPLC	High performance liquid chromatography
IP	Interfacial polymerization
LBL	Layer-by-layer
LC	Liquid chromatography
MPD	M-phenylene-diamine
MWCO	Molecular weight cut-off
NF	Nanofiltration
NRF	Normalized relative flux
OFAT	One-factor-at-a-time
PES	Polyethersulfone
PP	Polyetherimide, polypropylene
PSf	Polysulfone
RFR	Relative flux reduction
RI	Refractive index

RO	Reverse osmosis
RSM	Response surface methodology
TEOA	Triethanolamine
TFC	Thin-film composite
TMC	Trimesoyl chloride