



اَبُو سَيْدٍ تَكْنُوْلُو كِيْ مَارَا
UNIVERSITI
TEKNOLOGI
MARA

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TITLE:

PRELIMINARY MECHANICAL PROPERTIES STUDY ON
ADDITION OF TITANIUM DIOXIDE NANOPARTICLES INTO
POLYSULFONE SUBSTRATE FOR DESALINATION APPLICATION

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AUTHOR'S DECLARATION

“ I hereby declare that this report is my own work except for quotations and summaries which have been duly acknowledged.”

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ABSTRACT

The Earth surface mostly covers about 71% water where only 0.5% known as fresh water that safe to be use for drinking while the balance is categorized as sea water. The population of human lives increasing over years; hence, the demands of fresh water also increase for daily used consumption. In order to produce fresh water, the desalination process by using reverse osmosis method has been chosen where it is known as a process to remove the dissolved salts from the sea water with low cost and low energy consumption. From the previous study, fabrication of Polysulfone (psf) substrate with nanoparticles such as Titanium Dioxide (TiO_2) have successfully increased salts rejection. In terms of mechanical properties, the addition of Titanium nanoparticles contributes in increasing the strength of the membrane. For this study, initially, dope solutions which contains 15% of Polysulfone (psf), 84.5% of N-methyl-2-pyrrolidone (NMP), 0.5% of Polyvinylpyrrolidone (PVP) and 0.002% of Titanium Dioxide (TiO_2) were prepared to fabricate Polysulfone substrate. Afterwards, mechanical analysis such as tensile testing took place to investigate the strength of the membrane. The result showed membrane with addition of single layer of Titanium nanoparticles has higher tensile strength at 1.42 MPa compare with control sample which is 0.77 MPa. In conclusion, addition of Titanium Dioxide (TiO_2) helps to increase the mechanical properties of the membrane.

TABLE OF CONTENTS

	Page
AUTHOR'S DECLARATION	2
ABSTRACT	3
TABLE OF CONTENTS	4 - 5
CHAPTER ONE BACKGROUND	6
1.1 Introduction	6
1.2 Literature Review	7-9
1.2.1 Water crisis	
1.2.2 Desalination	
1.2.3 Polysulfone (PSF) membrane	
1.2.4 Titanium Dioxide (TiO ₂) nanoparticles	
1.3 Problem Statement	10
1.4 Objectives	10
1.5 Scope of Study	10
CHAPTER TWO METHODOLOGY	11
2.1 Introduction	11
2.2 Materials	11
2.3 Method	12 - 13
2.3.1 Dope solution preparation	
2.3.2 Membrane fabrication	
2.3.3 Tensile strength analysis	
CHAPTER THREE RESULT AND DISCUSSION	14
3.1 Introduction	14
3.2 Data Analysis	14
3.2.1 Single layered of PSF membrane	15 - 18
3.2.2 Single layered of PSF membrane with TiO ₂ addition	19 - 22
3.3 Discussion	23

CHAPTER FOUR CONCLUSION AND RECOMMENDATION	24
4.1 Conclusion	24
4.2 Recommendation	24 - 25
REFERENCES	26 - 28