# CONTENTS

## CHAPTER 1. INTRODUCTION

1.1 Introduction .......................... 01
1.2 Natural Fibre- Polymer Composites .......... 04
1.3 Aim and Scope of the present work .......... 04
1.4 Publications by the Author ................ 05
   References .................................. 06

## CHAPTER 2. MATERIALS AND METHODS

2.1 Introduction ......................... 09
2.2 Materials ............................ 10
   2.2.1 Matrix .............................. 10
   2.2.2 Thermosetting component in the blend .... 11
2.3 Reinforcement ....................... 11
2.4 Methods .............................. 12
   2.4.1 Fiber/Fabric Testing ................. 12
   2.4.1.1 Polarized optical microscopy ...... 12
   2.4.1.2 Scanning Electron Microscopy .... 12
   2.4.1.3 Fourier transform infrared  
       spectroscopic analysis ................ 12
   2.4.1.4 Thermogravimetric analysis ...... 12
2.5 Miscibility of blend matrix .............. 13
2.6 Performance of the matrix materials ...... 13
2.7 Fibre Properties .................... 14
   References .................. 15

## CHAPTER 3. MISCIBILITY OF EPOXY/5% UNSATURATED POLYESTER RESIN BLEND

3.1 Introduction ....................... 16
3.2 Experimental ...................... 16
3.3 Results and Discussion ............... 17
   References .............................. 25
CHAPTER 4. TENSILE PROPERTIES OF EPOXY COATED NATURAL FABRIC *HILDEGARDIA POPULIFOLIA*

4.1 Introduction ..... 26
4.2 Materials and Methods ..... 26
  4.2.1 Materials ..... 26
    4.2.1.1 Reinforcement ..... 26
    4.2.1.2 Matrix ..... 27
  4.2.2 Methods ..... 27
    4.2.2.1 Sample Preparation ..... 27
    4.2.2.2 Measurement of tensile strength ..... 27
4.3 Results and Discussion ..... 27
References ..... 30

CHAPTER 5 TENSILE PROPERTIES OF UNSATURATED POLYESTER COATED NATURAL FABRIC *HILDEGARDIA POPULIFOLIA*

5.1 Introduction ..... 31
5.2 Materials and Methods ..... 32
  5.2.1 Materials ..... 32
    5.2.1.1 Reinforcement ..... 32
    5.2.1.2 Matrix ..... 32
  5.2.2 Methods ..... 32
    5.2.2.1 Sample Preparation ..... 33
    5.2.2.2 Measurement of tensile strength ..... 33
    5.2.2.3 Polarized optical microscopy ..... 33
    5.2.2.4 Scanning Electron Microscopy ..... 33
    5.2.2.5 Fourier transform infrared spectroscopic Analysis ..... 34
5.3 Results and Discussion ..... 34
References ..... 40

CHAPTER 6. TENSILE PROPERTIES OF EPOXY/5% UNSATURATED POLYESTER RESIN BLEND MATRIX COATED BAMBOO FIBRES

6.1 Introduction ..... 41
6.2 Materials and Methods ..... 41
  6.2.1 Materials ..... 41
    6.2.1.1 Reinforcement ..... 41
    6.2.1.2 Chemicals ..... 42
6.2.2 Methods
   6.2.2.1 Sample Preparation
   6.2.2.2 Measurement of tensile load
   6.2.2.3 Measurement of chemical resistance
6.3 Results and Discussion
   References

CHAPTER 7. THERMOGRAVIMETRIC ANALYSIS OF BAMBOO FIBRES

  7.1 Introduction
  7.2 Materials and Methods
     7.2.1 Material
        7.2.1.1 Bamboo fibres
     7.2.2 Method
    7.3 Results and Discussion
       References

SUMMARY AND CONCLUSIONS

PUBLICATIONS BY THE AUTHOR