

**MORPHOLOGICAL STUDY OF ELECTROSPUN POLYBENZOXAZINE  
BLENDED WITH POLYETHYLENE OXIDE**

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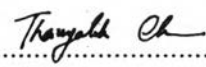
**Thesis Title:** Morphological Study of Electrospun Polybenzoxazine  
Blended with Poly(ethylene oxide)  
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**Program:** Polymer Science  
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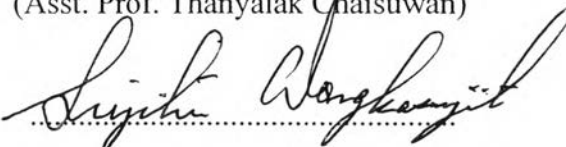
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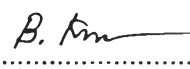
  
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## ABSTRACT

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In this work, polybenzoxazine (PBZ) based electrospun nanofibers were fabricated with the help of poly(ethylene oxide) (PEO) by electrospinning technique. The influence of PEO on the electrospinnability of the BZ solution, the effects of spinning voltage and collecting distance from the tip to the target, on the morphological appearance and average diameter of the as-spun PBZ/PEO blended fibers were investigated. The FE-SEM micrograph showed that for a 6/4 weight ratio of BZ solution to PEO solution, the PEO can enhance the electrospinnability of the BZ solution. The spinning voltage and collecting distance of 4 kV and 25 cm were used, respectively. The diameter of electrospun PBZ/PEO blended fibers was in a range of 600 nm to 1  $\mu$ m, with a generally uniform thickness along the fiber and high aspect ratio.

## บทคัดย่อ

พิชชาภรณ์ สุขเจริญ : การศึกษาสมบัติทางสัณฐานของเส้นใยพอลิเบนซอกซาซีน ผสานกับพอลิเอทิลีนออกไซด์ (Morphological Study of Electrospun Polybenzoxazine Blended with Poly(ethylene oxide) อ.ที่ปรึกษา : ผศ. ดร. ธัญญลักษณ์ ฉายสุวรรณ และ รศ. ดร.สุจิตรา วงศ์เกษมจิตต์ 54 หน้า

ในงานวิจัยนี้ผลิตพอลิเบนซอกซาซีนเส้นใยนาโนไฟเบอร์โดยการเติมพอลิเอทิลีนออกไซด์ด้วยเครื่องปั่นเส้นใยนาโนด้วยไฟฟ้าสถิตย์ โดยศึกษาอิทธิพลของพอลิเอทิลีนออกไซด์ที่มีผลต่อความสามารถในการปั่นเป็นเส้นใยนาโนไฟเบอร์ของสารละลายเบนซอกซาซีน อิทธิพลของความต่างศักย์ไฟฟ้าและระยะห่างระหว่างหัวเข็มกับแหล่งเก็บเส้นใย ที่มีผลต่อลักษณะสัณฐานและขนาดเส้นผ่านศูนย์กลางโดยเฉลี่ยของเส้นใยพอลิเบนซอกซาซีน ผสานกับพอลิเอทิลีนออกไซด์ ภาพที่ศึกษาภายใต้กล้องจุลทรรศน์อิเล็กตรอนแบบส่องกราดชนิด field-emission พบว่าการผสมของสารละลายเบนซอกซาซีนกับสารละลายพอลิเอทิลีนออกไซด์ที่อัตราส่วน 6/4 พอลิเอทิลีนออกไซด์ช่วยเพิ่มความสามารถในการปั่นเป็นเส้นใยนาโนไฟเบอร์ของสารละลายเบนซอกซาซีน โดยใช้ความต่างศักย์ไฟฟ้า 4 กิโลโวลต์ และระยะห่างระหว่างหัวเข็มกับแหล่งเก็บเส้นใยเป็น 25 เซนติเมตร เส้นใยพอลิเบนซอกซาซีน ผสานกับพอลิเอทิลีนออกไซด์มีขนาดเส้นผ่านศูนย์กลางอยู่ในช่วง 600 นาโนเมตร ถึง 1 ไมโครเมตร มีความสม่ำเสมอตลอดทั้งเส้นใยและมีอัตราส่วนลักษณะสูง (aspect ratio)

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## TABLE OF CONTENTS

	<b>PAGE</b>
Title Page	i
Abstract (in English)	iii
Abstract (in Thai)	iv
Acknowledgements	v
Table of Contents	vi
List of Tables	ix
List of Figures	x
 <b>CHAPTER</b>	
<b>I INTRODUCTION</b>	<b>1</b>
 <b>II LITERATURE REVIEW</b>	 <b>3</b>
 <b>III EXPERIMENTAL</b>	 <b>21</b>
3.1 Materials	21
3.2 Measurements	21
3.2.1 Fourier Transform Infrared Spectroscopy (FT-IR)	21
3.2.2 Field Emission Scanning Electron Microscopy (FE-SEM)	21
3.2.3 Thermogravimetric Analyzer (TGA)	21
3.3 Experimental	22
3.3.1 Preparation of Benzoxazine Precursor	22
3.3.2 Preparation of Poly(ethylene oxide) Solution	22
3.3.3 Preparation of Polybenzoxazine/Poly (ethylene oxide) Blended Fibers	22
3.3.4 Characterizations of Benzoxazine Precursor, Poly(ethylene oxide) Solution and Polybenzoxazine/Polyethylene Blended Fibers	22

CHAPTER	PAGE
<b>IV MORPHOLOGICAL STUDY OF ELECTROSPUN POLYBENZOXAZINE BLENDED WITH POLY(ETHYLENE OXIDE)</b>	23
4.1 Abstract	23
4.2 Introduction	24
4.3 Experimental	25
4.3.1 Materials	25
4.3.2 Measurements	25
4.3.3 Methodology	25
4.3.3.1 Preparation of Benzoxazine Precursor	25
4.3.3.2 Preparation of Poly(ethylene oxide) Solution	26
4.3.3.3 Preparation of Polybenzoxazine/Poly(ethylene oxide) Blended Fibers	26
4.3.3.4 Characterizations of Benzoxazine Precursor, Poly(ethylene oxide) Solution and Polybenzoxazine/Poly(ethylene oxide) Blended Fibers	26
4.4 Results and Discussion	27
4.4.1 Preparation of Benzoxazine Precursor	27
4.4.2 Preparation of Poly(ethylene oxide)	27
4.4.3 Preparation and Characterizations of Polybenzoxazine/Poly(ethylene oxide) Blended Fibers	28
4.4.3.1 Effect of Weight Compositions of Benzoxazine solution and Poly(ethylene oxide) Solution on the Morphology of Polybenzoxazine/ Poly(ethylene oxide) Blended Fibers	28
4.4.3.2 Effect of the Applied Voltage on Morphology of Polybenzoxazine/ Poly(ethylene oxide) Blended Fibers	30

<b>CHAPTER</b>	<b>PAGE</b>
4.4.3.3 Effect of the Collecting Distance on Morphology of Polybenzoxazine/ Poly(ethylene oxide) Blended Fibers	32
4.4.3.4 Effect of the Needle Diameter on Morphology of Polybenzoxazine/ Poly(ethylene oxide) Blended Fibers	34
4.4.4 Characterization of Benzoxazine Precursor, Poly(ethylene oxide), and Polybenzoxazine/ Polyethylene Blended Fibers	36
4.4.4.1 Proton Nuclear Magnetic Resonance ( <sup>1</sup> H NMR)	36
4.4.4.2 Fourier Transform Infrared Spectroscopy (FT-IR)	37
4.4.4.3 Thermogravimetric Analyzer (TGA)	39
4.5 Conclusions	41
4.6 Acknowledgements	41
4.7 References	41
<b>V CONCLUSIONS AND RECOMMENDATIONS</b>	<b>43</b>
<b>REFERENCES</b>	<b>44</b>
<b>CURRICULUM VITAE</b>	<b>54</b>



**LIST OF TABLES**

<b>TABLE</b>		<b>PAGE</b>
4.1	Thermal properties of polybenzoxazine, poly(ethylene oxide) and Polynenzoxazine/Poly(ethylene oxide) blended fibers	40

## LIST OF FIGURES

<b>FIGURE</b>		<b>PAGE</b>
<b>CHAPTER II</b>		
2.1	Conceptualized illustration of the functional group of a PLE.	3
2.2	Structures of DOW 3N and DOW 2N.	5
2.3	Synthesis of Polybenzoxazines by the ring-opening of the cyclic monomers only by heat treatment.	9
2.4	Synthesis of 3,4-dihydro-2H-1,3-benzoxazines.	10
2.5	Synthesis of bisphenol-A and aniline based benzoxazine (B-a) monomer.	11
2.6	Photopolymerization of benzoxazine.	12
2.7	Synthesis of polybenzoxazine precursors.	14
2.8	Preparation polybenzoxazine matrix by using AB-type aminophenols.	15
2.9	A schematic of the electrospinning process.	17
2.10	A schematic of electrospraying.	18
<b>CHAPTER IV</b>		
4.1	Synthesis of benzoxazine precursor.	27
4.2	The chemical structure of poly(ethylene oxide).	27
4.3	FE-SEM micrographs of polybenzoxazine/poly(ethylene oxide) blended fibers with the applied voltage 5 kV and the distance between the tip of the needle and the target of 20 cm with various weight compositions of benzoxazine precursor to poly(ethylene oxide) solution (a) 100:0, (b) 90:10, (c) 80:20, (d) 70:30 and (e) 60:40; 1000x.	28

**LIST OF FIGURES**

<b>FIGURE</b>		<b>PAGE</b>
4.4	FE-SEM micrographs of polybenzoxazine/poly(ethylene oxide) (60:40) blended fibers with the distance between the tip of the needle and the target of 20 cm and the applied voltage at (a) 4 kV, (b) 5 kV, (c) 6 kV and (d) 7 kV; 1000x.	31
4.5	Diagram of fiber diameter of polybenzoxazine solution/poly(ethylene oxide) solution (60:40) blended fibers with the distance between the tip of the needle and the target of 20 cm and the applied voltage at 4 kV, 5 kV, 6 kV and 7 kV.	32
4.6	FE-SEM micrographs of polybenzoxazine solution/poly(ethylene oxide) solution (60:40) blended fibers with the applied voltage of 4 kV and the distance between the tip of the needle and the target at (a) 10 cm, (b) 15cm, (c) 20 cm and (d) 25 cm; 2000x.	33
4.7	Diagram of fiber diameter of polybenzoxazine solution/poly(ethylene oxide) solution (60:40) blended fibers with the applied voltage of 4 kV and the distance between the tip of the needle and the target at 15cm, 20 cm and 25 cm.	34
4.8	FE-SEM micrographs of polybenzoxazine solution/poly(ethylene oxide) solution (60:40) blended fibers, the applied voltage of 4 kV and the distance between the tip of the needle and the target at 20 cm and the needle diameter of 0.5 mm with a magnification of (a) 2000, (b) 10,000 and (c) 35,000.	35
4.9	Diameter distributions of polybenzoxazine/poly(ethylene oxide) blended fibers.	36
4.10	<sup>1</sup> H NMR spectrum of benzoxazine precursor.	37

**LIST OF FIGURES**

<b>FIGURE</b>		<b>PAGE</b>
4.11	FT-IR spectrum of (a) benzoxazine precursor, (b) poly benzoxazine/poly(ethylene oxide) (60:40) blended fibers and (c) poly(ethylene oxide).	38
4.12	TGA of polybenzoxazine/poly(ethylene oxide) blended fibers.	39