

**MOLECULAR DESIGN AND SYNTHESIS OF BENZIMIDAZOLE
HETEROCYCLE: A MODEL MOLECULE FOR A HYDROGEN BONDED
PROTON TRANSFER NETWORK**



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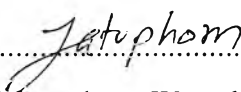
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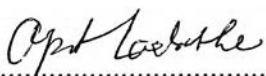
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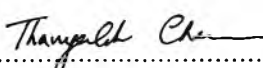

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ABSTRACT

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A series of difunctional benzimidazole-based compound, i.e., 1,4-di(1*H*-benzo[*d*]imidazol-2-yl)benzene, **1**, and 3,5-di(1*H*-benzo[*d*]imidazol-2-yl)benzenamine, **2** are designed as model compounds for the proton transferring pathway in water free system. The model compound **1** is developed by cyclizing terephthaloyl chloride and 1,2-phenylenediamine via amidation and ring closure reactions. In the same pathway, 5-aminoisophthalic acid and 1,2-phenylenediamine as the starting materials for **2** is also proposed. The work also shows how the reaction is effective if the amino group of 5-aminoisophthalic acid is protected during the reaction. The structures of the compounds are characterized by using FT-IR, ¹H-NMR, MALDI-TOF and EA techniques.

บทคัดย่อ

เปรียว เอี่ยมละมัย : การออกแบบและสังเคราะห์วงแหวนเฮเทอโรโมเลกุลประเภทเบนซิมิดาโซล โมเลกุลต้นแบบสำหรับศึกษาการเคลื่อนที่ของโปรตอนผ่านพันธะไฮโดรเจน (Molecular Design and Synthesis of Benzimidazole Heterocycle: A Model Molecule for a Hydrogen Bonded Proton Transfer Network) อ. ที่ปรึกษา : รศ. ดร. สุวบุญ จิระชาญชัย 45 หน้า

ชุดโมเลกุลไดฟังก์ชันเบนซิมิดาโซล คือ 1,4-ได(1เอช-เบนโซ[ดี]อิมิดาโซล-2-อิล)เบนซีน, **1**, และ 3,5-ได(1เอช-เบนโซ[ดี]อิมิดาโซล-2-อิล)เบนซีนเอมีน, **2** ถูกออกแบบขึ้นให้เป็นโมเลกุลต้นแบบสำหรับการส่งผ่านโปรตอนแบบไม่ใช้น้ำ โมเลกุลต้นแบบ **1** ถูกเตรียมสำเร็จได้จากการปัดวงของสารประกอบจำพวกเอไมด์ซึ่งผ่านการสังเคราะห์ด้วยปฏิกิริยาเอมิเดชันของเทรพทาลอิต คลอไรด์และ 1,2-ฟีนิลีนไดเอมีน ในทำนองเดียวกันโมเลกุลต้นแบบ **2** นั้นถูกเตรียมได้จากสารตั้งต้น 5-อะมิโนไอโซพธาลิก แอซิดและฟีนิลีนไดเอไมด์ งานนี้ยังแสดงให้เห็นว่าปฏิกิริยาจะมีประสิทธิภาพขึ้นถ้าหมู่เอมีนได้รับการป้องกันระหว่างการดำเนินปฏิกิริยา โครงสร้างของสารถูกพิสูจน์ทราบโดยเทคนิคอินฟราเรด, นิวเคลียร์แมกเนติกเรโซแนนซ์, มัลติทอพ แมสสเปกโทรเมทรี และการวิเคราะห์ธาตุ

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TABLE OF CONTENTS

	PAGE
Title Page	i
Abstract (in English)	iii
Abstract (in Thai)	iv
Acknowledgements	v
Table of Contents	vi
List of Tables	viii
List of Figures	ix
List of Schemes	xi
CHAPTER	
I INTRODUCTION	1
II THEORETICAL BACKGROUND AND LITERATURE REVIEW	3
2.1 General principle of fuel cell	3
2.2 Classification of fuel cell	4
2.3 Polymer Electrolyte Membrane Fuel Cell (PEMFC)	8
2.4 Polymer Electrolyte Membrane (PEM)	8
2.4.1 Water-based System	9
2.4.2 Water-free System	10
2.4.2.1 Incorporated Heterocyclic Molecule into the Main Chain	12
2.4.2.2 Incorporated Heterocyclic Molecule into the Side Chain	13
2.4.2.3 Blended Heterocyclic Molecule with Polymer Chain	14
2.5 Synthesis of Benzimidazole in Reports	15

CHAPTER	PAGE	
III	EXPERIMENTAL	17
	3.1 Materials	17
	3.2 Instruments and Equipment	17
	3.3 Methodology	18
	3.3.1 Synthesis of 1,4-di(1 <i>H</i> -benzo[<i>d</i>]imidazol-2-yl)benzene	18
	3.3.2 Synthesis of 3,5-di(1 <i>H</i> -benzo[<i>d</i>]imidazol-2-yl) benzenamine via pathway A	19
	3.3.3 Synthesis of 3,5-di(1 <i>H</i> -benzo[<i>d</i>]imidazol-2-yl) benzenamine via pathway B	19
	3.3.4 Sulfonation of poly(ether-ether-ketone) (PEEK)	20
IV	MOLECULAR DESIGN AND SYNTHESIS OF BENZIMIDAZOLE HETEROCYCLE: A MODEL MOLECULE FOR A HYDROGEN BONDED PROTON TRANSFER NETWORK	23
	4.1 Abstract	23
	4.2 Introduction	24
	4.3 Experimental	25
	4.4 Results and Discussion	30
	4.5 Conclusions	39
	4.6 Acknowledgements	40
	4.7 References	40
V	CONCLUSIONS AND RECOMMENDATIONS	41
	REFERENCES	42
	CURRICULUM VITAE	45

LIST OF TABLES

TABLE		PAGE
2.1	Comparison of different fuel cells	6

LIST OF FIGURES

FIGURE	PAGE
CHAPTER I	
1.1	Chemical structure of 3,5-di(1 <i>H</i> -benzo[<i>d</i>]imidazol-2-yl)benzenamine, 1 and 3,5-di(1 <i>H</i> -benzo[<i>d</i>]imidazol-2-yl)benzene, 2
	2
CHAPTER II	
2.1	Schematic of fuel cell
	4
2.2	Types of fuel cell; (a) single cell of fuel cell, and (b) fuel cell stack
	4
2.3	Components of PEMFC
	8
2.4	Chemical structure of perfluorinated polymer electrolyte membranes
	9
2.5	Schematic of proton transport mechanisms; (a) vehicle mechanism, (b) Grotthuss or hopping mechanism
	10
2.6	Morphologies and the relation between conductivity and temperature of Nafion membrane at; (a) < 80°C, and (b) > 80°C
	11
2.7	Proton transfer process as proposed by Daycock <i>et al.</i>
	12
2.8	Chemical structure and temperature dependence of ionic conductivity of PA-doped 2,5-PPBI membranes
	13
2.9	Chemical structure and Arrhenius conductivity plots of the bimPSAGEx samples
	14
2.10	Chemical structure and temperature dependence of DC conductivity of the BnIm _x AA blends Arrhenius conductivity plots of the bimPSAGEx samples
	15

FIGURE		PAGE
CHAPTER IV		
4.1	Chemical structures of 3,5-di(1 <i>H</i> -benzo[<i>d</i>]imidazol-2-yl)benzenamine, 1 , and 3,5-di(1 <i>H</i> -benzo[<i>d</i>]imidazol-2-yl)benzene, 2	25
4.2	FT-IR spectra of 1' (a), and 1 (b)	31
4.3	¹ H-NMR spectrum of 1	32
4.4	MALDI-TOF mass spectrum of 1	32
4.5	FT-IR spectra of 2' (a), and 2 (b)	33
4.6	MALDI-TOF mass spectrum of crude product from pathway A	34
4.7	FT-IR spectrum of 2 from the pathway B	36
4.8	¹ H-NMR spectrum of 2 from the pathway B	36
4.9	MALDI-TOF mass spectrum of 2 from the pathway B	37
4.10	FT-IR spectra of PEEK (a), and SPEEK (b)	38
4.11	¹ H-NMR spectrum of SPEEK	39

LIST OF SCHEMES

SCHEME	PAGE
CHAPTER II	
2.1 Preparation of benzimidazole oligomers	16
2.2 Preparation of 2-(4-bromophenyl)-1 <i>H</i> -benzimidazole	16
CHAPTER III	
3.1 Preparation of 1	18
3.2 Preparation of 2 via pathway A	19
3.3 Preparation of 2 via pathway B	21
3.4 Sulfonation of poly(ether ether ketone)	22
CHAPTER IV	
4.1 Preparation of 1	27
4.2 Preparation of 2 via pathway A	28
4.3 Preparation of 2 via pathway B	29
4.4 Sulfonation of poly(ether ether ketone).	30
4.5 Probable structures of by-products	34