

PREPARATION AND CHARACTERIZATION COMPOSITE
OF HYBRID ORGANIC-INORGANIC MATERIAL OF
BITHIOPHENE AND TETRAETHOXYSILANE

ZURAIDAH BINTI HASSIM

FACULTY OF SCIENCE AND TECHNOLOGY
KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA

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**PREPARATION AND CHARACTERIZATION COMPOSITE OF HYBRID ORGANIC-
INORGANIC MATERIAL OF BITHIOPHENE AND TETRAETHOXYSILANE**

By

Zuraidah binti Hassim

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Faculty of Science and Technology
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JABATAN KIMIA
FAKULTI SAINS DAN TEKNOLOGI
KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA

PENGAKUAN DAN PENGESAHAN LAPORAN
PROJEK PENYELIDIKAN I DAN II

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk:

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Disahkan oleh:

Penyelia Utama:

Nama: Dr. Nanok Kancono

Cop Rasmi:

Dr. Nanok Kancono
Pensyarah
Jabatan Sains Kimia
Fakulti Sains dan Teknologi
Kolej Universiti Sains dan Teknologi Malaysia
21030 Kuala Terengganu.

Tarikh: 26/04/2005

Penyelia Kedua

Nama: En. Mohamad Hussin bin Hj. Zain

Cop Rasmi: MOHAMAD HUSSIN HAJI ZAIN

Pensyarah
Jabatan Sains Kimia
Fakulti Sains dan Teknologi
Kolej Universiti Sains dan Teknologi Malaysia
21030 Mengabang
Kuala Terengganu.

Tarikh: 26/04/05

Ketua Jabatan Kimia

Nama: Prof. Madya Dr. Ku Halim bin Ku Bulat

Cop Rasmi: PROF. MADYA DR. KU HALIM KU BULAT

Ketua
Jabatan Sains Kimia
Fakulti Sains dan Teknologi
Kolej Universiti Sains dan Teknologi Malaysia
21030 Kuala Terengganu.
Tel: 09-6683257

Tarikh: 26 April 2005

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LIST OF ABBREVIATIONS

LCs	Liquid Crystals
LLCs	Lyotropic Liquid Crystals
TLCs	Thermotropic Liquid Crystals
LCPs	Liquid Crystal Polymers
SCLCPs	Side Chain Liquid Crystal Polymers
MCLCPs	Main Chain Liquid Crystal Polymers
TCNQ	Tetracyanoquinodimethane
FET	Field Effect Transistor
LCD	Liquid Crystal Display
UV	Ultraviolet
IR	Infrared
FTIR	Fourier Transform Infrared
NMR	Nuclear Magnetic Resonance
MP	Polarisation Microscope
MHz	Megahertz
XRD	X-Ray Diffraction
SEM	Scanning Electron Microscope
TEOS	Tetraethoxysilane
CDCl ₃	Deuterated chloroform
THF	Tetrahydrofuran
NBS	N-bromosuccinimide
MgSO ₄	Magnesium sulphate
HOAC	Acetic acid

LIST OF SYMBOLS

ϵ	molar absorption
A	total absorption
c	concentration in molar
L	cell length in cm
λ	wavelength
ppm	part per million

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ABSTRACT

Preparation and characterization of hybrid organic-inorganic composite material of bithiophene and tetraethoxysilane were prepared from the reaction of 5,5'-dibromobithiophene with tetraethoxysilane in tetrahydrofuran. The precursor of the reaction, bithiophene was prepared from the decoupling of bromothiophene in tetrahydrofuran with NiCl_2 as catalyst. While 5,5'-dibromobithiophene compound was prepared from the reaction of bithiophene with N-bromosuccinimide (NBS) in the mixture of chloroform and acetic acid. The yield of the compound was tested by using the Infrared (IR) Spectrometry, Ultraviolet (UV) Spectrometer, ^1H and ^{13}C of Nuclear Magnetic Resonance (NMR).

ABSTRAK

Penyediaan komposit hibrid bahan organik-tak organik bithiophene dan tetraethoxysilane telah dilakukan dengan tindakbalas 5,5'-dibromobithiophene bersama tetraethoxysilane di dalam tetrahydrofuran. Bahan awal tindakbalas iaitu bithiophene telah disediakan dengan tindakbalas berganda bromothiophene di dalam tetrahydrofuran dan telah dimangkinkan oleh NiCl_2 . Sementara itu, 5,5'-dibromobithiophene telah disediakan melalui tindakbalas bithiophene dengan N-bromosuccinimide (NBS) dalam campuran kloroform. Hasil daripada sebatian yang telah diperolehi telah diuji dengan Spektrometer Inframerah (IR), Spektrometer Ultraviolet (UV), ^1H dan ^{13}C Nuklear Magnetik Resonans (NMR).