

สื้อมทำเครื่องหมายจากสารสกัดเปลือกเมล็ดมะม่วงหิมพานต์และคลอโรไนโตรอะนิน



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MARKER DYES FROM CASHEW NUT SHELL EXTRACT AND  
CHLORONITROANILINES

Miss Sewika Chongpiyawarang

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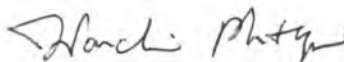
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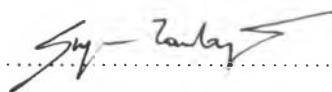
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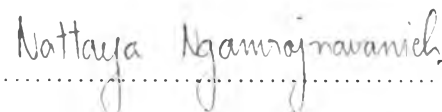
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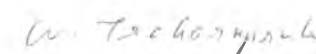
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สีย้อมทำเครื่องหมายในกลุ่มของคลอโรไนโตรอะนินีนสังเคราะห์ได้จากปฏิกิริยาควคู  
ระหว่างสารประกอบอัลคิลซาลิไซเลทและสารสกัดเปลือกเมล็ดมะม่วงหิมพานต์ที่ผ่านกระบวนการ  
เอสเทอร์ฟิเคชันแล้วกับคลอโรไนโตรอะนินีน 4 ชนิด สีย้อมทำเครื่องหมายแต่ละชนิดจะนำ  
มาเติมลงในน้ำมันดีเซลในปริมาณที่ต่ำมากจนไม่พบการเปลี่ยนแปลงคุณสมบัติทางกายภาพและ  
ทางเคมีของน้ำมันดีเซลที่ทำเครื่องหมายไว้ ขั้นตอนการตรวจสอบจะใช้ระบบตัวทำละลายที่  
เหมาะสมในการสกัดประกอบด้วยระบบตัวทำละลายร่วมและเบส ทำให้สีย้อมทำเครื่องหมายถูก  
ถ่ายโอนจากน้ำมันดีเซลที่ทำเครื่องหมายไว้มาสู่ชั้นระบบสารสกัดและสามารถแสดงสีที่สังเกตได้  
อย่างชัดเจน การวิเคราะห์ในเชิงปริมาณนั้นใช้การวัดปริมาณความเข้มข้นของสีย้อมทำเครื่องหมาย  
ในกรณีของการเจือจาง การปลอมปน และความคงทนต่อการเก็บรักษา นอกจากนี้สีย้อม  
ทำเครื่องหมายยังสามารถบ่งชี้ถึงความแตกต่างของน้ำมันเชื้อเพลิงที่เสี่ยภาที่ต่างกันและน้ำมันที่  
หลบเลี่ยงภาษีได้อีกด้วย

ภาควิชา.....ลายมือชื่อนิสิต.....  
สาขาวิชา.....ปีโดรเคมีและวิทยาศาสตร์พอลิเมอร์.....ลายมือชื่ออาจารย์ที่ปรึกษา.....  
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KEY WORD :

MARKER DYES / DIESEL / CHLORONITROANILINES / THE CASHEW NUT SHELL EXTRACT. SEWIK A CHONGPIYAWARANG : MARKER DYES FROM CASHEW NUT SHELL EXTRACT AND CHLORONITROANILINES. THESIS ADVISOR : ASSOC. PROF. AMORN PETSOM , Ph.D. THESIS CO - ADVISOR : NATTAYA NGAMROJNAVANICH , Ph. D. 160 p.p. ISBN 974-334-024-6 .

The marker dyes in the homologous series of chloronitroanilines were synthesized by the coupling reactions between alkylsalicylate compounds and the esterified cashew nut shell liquid with four types of chloronitroanilines. Each of the marker dyes was added into diesel oil at low concentrations thus they did not alter the physical and chemical properties of the marked diesel oil. The method for detecting was achieved by treating the appropriate solvent extraction systems comprising cosolvent systems and base. These marker dyes could be transferred from the marked diesel oil into the solvent extraction phases and could exhibit their obviously visual color. The quantitative determinations were required to measure the marker dyes ' concentrations in diesel oil in case of dilution , adulteration and storage stability. Furthermore, these marker dyes were tagged to distinguish the different taxed and smuggled petroleum fuels.

ภาควิชา.....ลายมือชื่อนิสิต.....

สาขาวิชา.....ลายมือชื่ออาจารย์ที่ปรึกษา.....  
ปีโตรเคมีและวิทยาศาสตร์พอลิเมอร์ 

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## CONTENTS

	<b>Page</b>
Abstract in Thai.....	iv
Abstract in English.....	v
Acknowledgement.....	vi
Content.....	vii
List of Tables.....	xi
List of Figures.....	xiii
List of Abbreviations.....	xviii

### CHAPTER I : INTRODUCTION

Introduction.....	1
1.1 The scopes of this research.....	3
1.2 The objectives of this research.....	4

### CHAPTER II : THEORY AND LITERATURE REVIEW

2.1 The cashew tree and Cashew Nut Shell Liquid (CNSL).....	5
2.2 Esterification.....	7
2.3 Synthesis of azo dyes.....	8
2.4 Marker dyes for petroleum fuels.....	12
2.5 Literature review.....	13

## CHAPTER III : EXPERIMENTAL

3.1 Chemicals.....	20
3.2 Apparatus.....	20
3.3 Experimental Procedures.....	21
3.3.1 Esters.....	21
3.3.2 Preparation of diazonium salts of chloronitroanilines.....	22
3.3.3 Preparation of phenolate ion of esters.....	23
3.3.4 Coupling Reactions.....	23
3.3.5 Acid reductions of the marker dyes.....	26
3.3.6 The appropriate solvent extraction systems for the marker dyes in diesel oil.....	26
3.3.7 Preparation of stock solution marker dyes B <sub>1</sub> -B <sub>4</sub> .....	28
3.3.8 Preparation of stock solution marker dyes C <sub>1</sub> -C <sub>4</sub> .....	29
3.3.9 Detection procedures for the marker dyes in the series of chloronitroanilines in diesel oil.....	30
3.3.10 Property tests for the marker dyes in diesel oil compared with the unmarked diesel oil.....	31
3.3.11 Quantitative determinations for the marker dyes in the series of chloronitroaniline in diesel oil.....	32



3.3.12 Stability tests for the marker dyes in the series of chloronitroanilines in diesel oil .....	32
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#### CHAPTER IV : RESULTS AND DISCUSSION

4.1 The characterization of octylsalicylate (Ester B).....	33
4.2 The characterization of CNSL and the esterified CNSL (Ester C).....	33
4.3 The characterization of the marker dyes from the esters A-C.....	35
4.4 The appropriate solvent extraction systems for the marker dyes in diesel oil.....	42
4.5 The detection procedures for the marker dyes in the series of chloronitroaniline derivatives in diesel oil.....	50
4.6 The effect of marker dyes set B and C to the physical properties of diesel oil compared with unmarked diesel oil.....	54
4.7 The quantitative determinations for the marker dyes in the series of chloronitroaniline derivatives in diesel oil.....	56
4.8 Stability of the marker dyes B <sub>1</sub> and C <sub>1</sub> in diesel oil.....	61
4.9 Method for detecting the suspected diesel oil.....	63

CHAPTER V : CONCLUSION .....	66
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**Page**

SUGGESTION.....68

REFERENCES.....69

APPENDIX.....72

VITA.....142

## LIST OF TABLES

Table		Page
3-1	The appropriate solvent extraction systems used for the detection procedures	27
3-2	ASTM test method	31
4-1	The $^{13}\text{C}$ -NMR chemical shifts of marker dyes A <sub>1</sub> -A <sub>4</sub>	36
4-2	The marker dyes set A in the series of chloronitroanilines	37
4-3	The $^{13}\text{C}$ -NMR chemical shifts of marker dyes B <sub>1</sub> -B <sub>4</sub>	38
4-4	The marker dyes set B in the series of chloronitroanilines	39
4-5	The $^{13}\text{C}$ -NMR chemical shifts of marker dyes C <sub>1</sub> -C <sub>4</sub>	40
4-6	The marker dyes set C in the series of chloronitroanilines	41
4-7	The results of solvent extraction systems for marker dyes A-C in diesel oil	43
4-8	The maximum absorption wavelengths and their specific visual colors of 5 ppm marker dye B <sub>1</sub> in diesel oil	47
4-9	The variation of base-types in ethylene glycol extracting the 5 ppm marker dye C <sub>1</sub> in diesel oil	48
4-10	The absorbances of solvent 1 extracting the marker dyes B <sub>1</sub> -B <sub>4</sub> and C <sub>1</sub> -C <sub>4</sub> from diesel oil	51

<b>Table</b>	<b>Page</b>
4-11 The physical properties of marked diesel oil compared with unmarked diesel oil.....	55
4-12 The maximum absorption wavelengths used for the quantitative determinations.....	57
4-13 The standard calibration equations for the quantitative determinations of marker dyes B <sub>1</sub> -B <sub>4</sub> and C <sub>1</sub> -C <sub>4</sub> .....	58
4-14 The concentration detection of marker dyes B <sub>1</sub> and C <sub>1</sub> in the period of 3 months.....	61

## LIST OF FIGURES

Figure	Page
2-1	The section of a cashew nut.....5
4-1	The variation of base quantities in ethylene glycol for the 5 ppm of marker dye C <sub>1</sub> in diesel oil.....46
4-2	The absorption curves of 5 ppm marker dyes C <sub>1</sub> in diesel oil extracting with solvent 1 for the ratios 5:1, 7:1 and 9:1.....50
4-3	The detection of marker dyes set B extracted with solvent 3.....60
4-4	The detection of marker dyes set C extracted with solvent 3.....60
4-5	The stability curve plotted between the average concentration of marker dyes B <sub>1</sub> and C <sub>1</sub> in diesel oil and time (weeks) by the solvent 3.....62
4-6	The dilution of marked diesel oil with 2,5 and 10 – fold dilution.....63
4-7	The mixed marker dyes set B in diesel oil extracted with solvent 3.....64
4-8	The mixed marker dyes set C in diesel Oil extracted with solvent 3.....65
A-1	FT-IR spectrum of marker dye A <sub>1</sub> .....72
A-2	H <sup>1</sup> - NMR spectrum of marker dye A <sub>1</sub> .....73
A-3	C <sup>13</sup> – NMR spectrum of marker dye A <sub>1</sub> .....74
A-4	FT-IR spectrum of marker dye A <sub>2</sub> .....75
A-5	H <sup>1</sup> - NMR spectrum of marker dye A <sub>2</sub> .....76

<b>Figure</b>	<b>Page</b>
A-6	$C^{13}$ – NMR spectrum of marker dye A <sub>2</sub> .....77
A-7	FT-IR spectrum of marker dye A <sub>3</sub> .....78
A-8	$H^1$ - NMR spectrum of marker dye A <sub>3</sub> .....79
A-9	$C^{13}$ – NMR spectrum of marker dye A <sub>3</sub> .....80
A-10	FT-IR spectrum of marker dye A <sub>4</sub> .....81
A-11	$H^1$ - NMR spectrum of marker dye A <sub>4</sub> .....82
A-12	$C^{13}$ – NMR spectrum of marker dye A <sub>4</sub> .....83
B-1	FT-IR spectrum of octylsalicylate (Ester B).....84
B-2	$H^1$ - NMR spectrum of octylsalicylate (Ester B).....85
B-3	$C^{13}$ – NMR spectrum of octylsalicylate (Ester B).....86
B-4	FT-IR spectrum of marker dye B <sub>1</sub> .....87
B-5	$H^1$ - NMR spectrum of marker dye B <sub>1</sub> .....88
B-6	$C^{13}$ – NMR spectrum of marker dye B <sub>1</sub> .....89
B-7	FT-IR spectrum of marker dye B <sub>2</sub> .....90
B-8	$H^1$ - NMR spectrum of marker dye B <sub>2</sub> .....91
B-9	$C^{13}$ – NMR spectrum of marker dye B <sub>2</sub> .....92
B-10	FT-IR spectrum of marker dye B <sub>3</sub> .....93
B-11	$H^1$ - NMR spectrum of marker dye B <sub>3</sub> .....94
B-12	$C^{13}$ – NMR spectrum of marker dye B <sub>3</sub> .....95
B-13	FT-IR spectrum of marker dye B <sub>4</sub> .....96
B-14	$H^1$ - NMR spectrum of marker dye B <sub>4</sub> .....97
B-15	$C^{13}$ – NMR spectrum of marker dye B <sub>4</sub> .....98

<b>Figure</b>	<b>Page</b>
C-1 FT-IR spectrum of CNSL.....	99
C-2 $H^1$ - NMR spectrum of CNSL.....	100
C-3 $C^{13}$ – NMR spectrum of CNSL.....	101
C-4 FT-IR spectrum of the esterified CNSL.....	102
C-5 $H^1$ - NMR spectrum of the esterified CNSL.....	103
C-6 $C^{13}$ – NMR spectrum of the esterified CNSL.....	104
C-7 FT-IR spectrum of marker dye $C_1$ .....	105
C-8 $H^1$ - NMR spectrum of marker dye $C_1$ .....	106
C-9 $C^{13}$ – NMR spectrum of marker dye $C_1$ .....	107
C-10 FT-IR spectrum of marker dye $C_2$ .....	108
C-11 $H^1$ - NMR spectrum of marker dye $C_2$ .....	109
C-12 $C^{13}$ – NMR spectrum of marker dye $C_2$ .....	110
C-13 FT-IR spectrum of marker dye $C_3$ .....	111
C-14 $H^1$ - NMR spectrum of marker dye $C_3$ .....	112
C-15 $C^{13}$ – NMR spectrum of marker dye $C_3$ .....	113
C-16 FT-IR spectrum of marker dye $C_4$ .....	114
C-17 $H^1$ - NMR spectrum of marker dye $C_4$ .....	115
C-18 $C^{13}$ – NMR spectrum of marker dye $C_4$ .....	116
D-1 The Calibration Curve of marker dye $B_1$ extracting with solvent 1.....	117
D-2 The calibration curve of marker dye $C_1$ extracting with solvent 1.....	118

<b>Figure</b>	<b>Page</b>
D-3 The calibration curve of marker dye B <sub>2</sub> extracting with solvent 1.....	119
D-4 The calibration curve of marker dye C <sub>2</sub> extracting with solvent 1.....	120
D-5 The calibration curve of marker dye B <sub>3</sub> extracting with solvent 1.....	121
D-6 The calibration curve of marker dye C <sub>3</sub> extracting with solvent 1.....	122
D-7 The calibration curve of marker dye B <sub>4</sub> extracting with solvent 1.....	123
D-8 The calibration curve of marker dye C <sub>4</sub> extracting with solvent 1.....	124
D-9 The calibration curve of marker dye B <sub>1</sub> extracting with solvent 2.....	125
D-10 The calibration curve of marker dye C <sub>1</sub> extracting with solvent 2.....	126
D-11 The calibration curve of marker dye B <sub>2</sub> extracting with solvent 2.....	127
D-12 The calibration curve of marker dye C <sub>2</sub> extracting with solvent 2.....	128
D-13 The calibration curve of marker dye B <sub>3</sub> extracting with solvent 2.....	129



D-14	The calibration curve of marker dye C <sub>3</sub> extracting with solvent 2.....	130
D-15	The calibration curve of marker dye B <sub>4</sub> extracting with solvent 2.....	131
D-16	The calibration curve of marker dye C <sub>4</sub> extracting with solvent 2.....	132
D-17	The calibration curve of marker dye B <sub>1</sub> extracting with solvent 3.....	133
D-18	The calibration curve of marker dye C <sub>1</sub> extracting with solvent 3.....	134
D-19	The calibration curve of marker dye B <sub>2</sub> extracting with solvent 3.....	135
D-20	The calibration curve of marker dye C <sub>2</sub> extracting with solvent 3.....	136
D-21	The calibration curve of marker dye B <sub>3</sub> extracting with solvent 3.....	137
D-22	The calibration curve of marker dye C <sub>3</sub> extracting with solvent 3.....	138
D-23	The calibration curve of marker dye B <sub>4</sub> extracting with solvent 3.....	139
D-24	The calibration curve of marker dye C <sub>4</sub> extracting with solvent 3.....	140

## ABBREVIATIONS

CNSL	=	Cashew Nut Shell Liquid
ml.	=	Milliliters
g.	=	Grams
nm.	=	Nanometers
wt.	=	Weight
vol.	=	Volume
ppm	=	Part-per-million
ASTM	=	American Society for Testing and Materials
IBP	=	Initial boiling point
TAN	=	Total Acid Number
FT-IR	=	Fourier Transform Infrared Spectroscopy
H <sup>1</sup> -NMR	=	Proton Nuclear Magnetic Resonance
C <sup>13</sup> -NMR	=	Carbon-13 Nuclear Magnetic Resonance
UV-VIS	=	Ultraviolet Visible Spectroscopy
cm <sup>-1</sup>	=	unit of wave number
°c	=	degree celsius
λ <sub>max</sub>	=	maximum wavelength