

การหาปริมาณสารเติมแต่งประเภทสารช่วยกระจายตัวในน้ำมันแก๊ซลิ้นและดีเซล

นายรุ่งโรจน์ อ่ำภา

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาวิทยาศาสตรมหาบัณฑิต

สาขาวิชาปิโตรเคมี

บัณฑิตวิทยาลัย จุฬาลงกรณ์มหาวิทยาลัย

ปีการศึกษา 2539

ISBN 974-636-761-5

ลิขสิทธิ์ของบัณฑิตวิทยาลัย จุฬาลงกรณ์มหาวิทยาลัย

I20010707

196

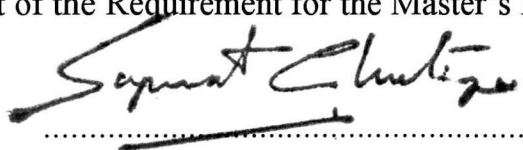
**DETERMINATION OF DISPERSANTS IN GASOLINE
AND DIESEL OIL**

Mr. Rungroj Ampha

**A Thesis Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Science
Program of Petrochemistry
Graduate School
Chulalongkorn University
Academic Year 1996
ISBN 974-636-761-5
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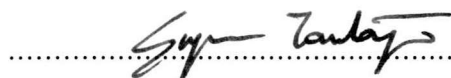
Thesis Title DETERMINATION OF DISPERSANTS IN GASOLINE
AND DIESEL OIL
By Mr. Rungroj Ampha
Program Petrochemistry and Polymer
Thesis advisor Assistant Professor Amorn Petsom Ph.D.

Accept by the Graduate School, Chulalongkorn University in Partial
Fullfilment of the Requirement for the Master's Degree



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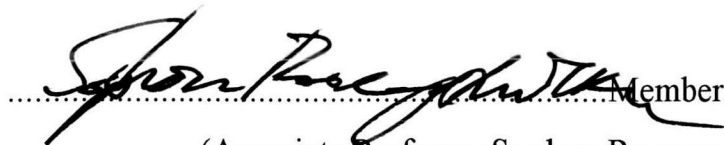
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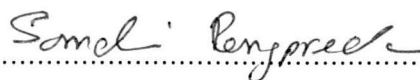
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พิมพ์ต้นฉบับบทคัดย่อวิทยานิพนธ์ภายในกรอบสี่เหลี่ยมนี้เพียงแผ่นเดียว

รื่องโรจน์ อ่ำภา : การหาปริมาณสารเติมแต่งประเภทสารช่วยกระจายตัวในน้ำมันแกโซลีนและดีเซล (DETERMINATION OF DISPERSANTS IN GASOLINE AND DIESEL OIL)
อ.ที่ปรึกษา : ผศ.ดร.อมร เพชรสม ; 212 หน้า. ISBN 974-636-761-5.

ในงานวิจัยนี้ได้ศึกษาและพัฒนาวิธีการวิเคราะห์เชิงปริมาณของสารเติมแต่งประเภทสารช่วยกระจายตัวในน้ำมันแกโซลีนและดีเซล โดยใช้เทคนิค HPLC/GPC ซึ่งเป็นการวิเคราะห์สารที่มีน้ำหนักโมเลกุลสูงในน้ำมันดังกล่าว สารที่มีน้ำหนักโมเลกุลสูงนี้คือสารโพลีเมอร์ เป็นองค์ประกอบหลักในสารเติมแต่งประเภทสารช่วยกระจายตัว แต่ไม่มีในน้ำมันพื้นฐาน เทคนิค HPLC/GPC นี้จึงเป็นการวิเคราะห์โดยทางตรงและไม่ขึ้นกับน้ำมันพื้นฐานหรือสารเติมแต่งชนิดอื่นที่มีขนาดโมเลกุลเล็ก ดังนั้นวิธีการนี้จึงให้ผลการวิเคราะห์ที่รวดเร็วและถูกต้อง ซึ่งมีความคลาดเคลื่อนไม่เกิน 5%

เทคนิค HPLC/GPC ในงานวิจัยนี้มีสภาวะที่เหมาะสมคือ คอลัมน์ชนิด PLgel 5 μ m 50 A 300x7.5 mm อุณหภูมิเครื่องตรวจวัดที่ 100°C. อัตราการไหลของก๊าซไนโตรเจน 8 l/min และอัตราการไหลของ THF ซึ่งใช้เป็นวัฏภาคเคลื่อนที่ 1 ml/min สำหรับน้ำมันดีเซลซึ่งมีความจำเป็นต้องแยกน้ำมันพื้นฐานออกก่อนนั้นมีสภาวะที่เหมาะสมคือ ใช้ตัวดูดซับเป็น Alumina neutral 2 g Hexane 10 ml THF 10 ml และใช้น้ำมันตัวอย่าง 25 ml. การหาปริมาณสารช่วยกระจายตัวทำได้โดยการเปรียบเทียบพื้นที่ใต้พีคของตัวอย่างน้ำมันที่ต้องการวิเคราะห์กับกราฟมาตรฐานของน้ำมันที่รู้ความเข้มข้นที่แน่นอน

ภาควิชา
สาขาวิชา
ปีการศึกษา

ลายมือชื่อนิสิต
ลายมือชื่ออาจารย์ที่ปรึกษา
ลายมือชื่ออาจารย์ที่ปรึกษาร่วม

C785103 PETROCHEMISTRY

KEY WORD: ^{MAJOR} DISPERSANT / GASOLINE ADDITIVE /
DIESEL ADDITIVE.

RUNGROJ AMPHA : DETERMINATION OF DISPERSANTS
IN GASOLINE AND DIESEL OIL.

THESIS ADVISOR : ASSIST. PROF. AMORN PETSOM, Ph.D.
212 pp. ISBN 974-636-761-5.

This research is intended to use in the quantitative determination of dispersant additive in gasoline and diesel oil by HPLC/GPC method. This method is used to determine the high molecular weight as polymer which in dispersant package but did not in base oil. The method is directed measurement and is independent of base oil or other small additive. Therefore the method is very accurate, fast and reproducible. The repeatability is more than 95%. The optimum conditions in HPLC/GPC method were PLgel 5 μ m 50 A 300x7.5 mm, 100°C of the EMD temperature, 8 l/min of Nitrogen gas flow rate, and 1 ml/min of THF as mobile phase flow rate. In diesel case it must be separated dispersant molecules away from base diesel with conditions such as 2 g. Alumina neutral as absorbent, 10 ml Hexane, 10 ml THF and 25 ml diesel sample.

The concentration of dispersant additive in unknown sample was determined by compared the peak area of the first peak in unknown sample with standard calibration curve of known sample.

ภาควิชา..... สหสาขาวิชา วิทยาศาสตร์ - โพลีเมอร์.....
สาขาวิชา..... วิทยาศาสตร์.....
ปีการศึกษา..... 2539.....
ลายมือชื่อนิสิต..... ร. ร.
ลายมือชื่ออาจารย์ที่ปรึกษา.....
ลายมือชื่ออาจารย์ที่ปรึกษาร่วม.....

ACKNOWLEDGEMENT

The author wishes to express his deepest gratitude to advisor, Assistant Professor Dr. Amorn Petsom for his guidance, advice and kindness throughout the course of this research and to Associate Professor Dr. Sophon Roengsumran for his kindly helping and advise. In addition, he is also grateful to Associate Professor Dr. Supawan Tantayanon for her valuable suggestions, discussions and comments.

He also thank for the research financial supports from Chulalongkorn University and many thanks are going to BRS. Intertrade Ltd., Part who provided the additive package, base oil and Evaporative Mass Detector for using in this research work.

He would like to express his gratitude to his friends and everyone who have contributed suggestion and support during this research.

Finally, he owed very deep and thanks to his family for their love, support and encouragement.

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LIST OF ABBREVIATIONS

A	=	Angstrom
°C	=	degree of celcius
cm ⁻¹	=	Wavenumber unit (reciprocal centimetre)
EMD	=	Evaporative Mass Detector
g	=	gram
GPC	=	Gel Permeation Chromatography
HPLC	=	High Performance Liquid Chromatography
IR	=	Infrared
µl	=	microlitre
l/min	=	litre per minute
ml/min	=	millilitre per minute
mm	=	millimetre
NMR	=	Nuclear Magnetic Resonance Spectroscopy
ppm	=	part per million
THF	=	Tetrahydrofuran
UV	=	Ultraviolet
UGP	=	unlead premium gasoline
ULG	=	unlead gasoline
ULR	=	unlead regular gasoline
wt/v	=	weight by volume
wt/wt	=	weight by weight
%	=	percent