

การเตรียมกราฟต์โคโพลิเมอร์ของสไตรีนและอะครีโลไนไตรลบนยางธรรมชาติ



นาย เฉลิมพล รุจินิรันคร

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาวิทยาศาสตรมหาบัณฑิต

สาขาวิชาวิทยาศาสตร์โพลิเมอร์

บัณฑิตวิทยาลัย จุฬาลงกรณ์มหาวิทยาลัย

พ.ศ.2538

ISBN 974-632-841-7

ลิขสิทธิ์ของบัณฑิตวิทยาลัย จุฬาลงกรณ์มหาวิทยาลัย

I 167186 41

**PREPARATION OF GRAFT COPOLYMERS OF STYRENE AND
ACRYLONITRILE ONTO NATURAL RUBBER**

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**A Thesis Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Science**

Program of Polymer Science

Graduate School

Chulalongkorn University

1995

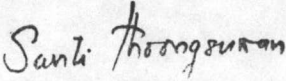
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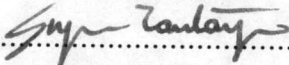
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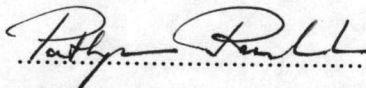
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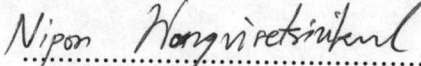
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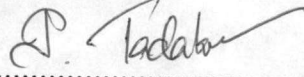

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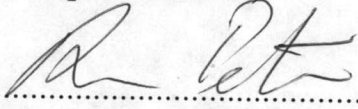
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เฉลิมพล รุจินันต์: การเตรียมกราฟต์โคโพลิเมอร์ของสไตรีนและอะครีโลไนไตรลบนยางธรรมชาติ
อาจารย์ที่ปรึกษาวิทยานิพนธ์ : รศ. ดร. ภัทรพรหม ประกาศนสารกิจ อาจารย์ที่ปรึกษาวิทยานิพนธ์ร่วม :
ผศ. ดร. นิพนธ์ วงศ์พิเศษสิริกุล และ คุณปฏิพล ธาตุกร, 112 หน้า. ISBN 974-632-841-7

งานวิจัยนี้เป็นการศึกษาการเตรียมโคโพลิเมอร์ของสไตรีนและอะครีโลไนไตรลบนยางธรรมชาติในสถานะอิมัลชัน โดยศึกษาปัจจัยต่างๆที่มีผลต่อปฏิกิริยากราฟต์โคโพลิเมอไรเซชัน ได้แก่ ความเข้มข้นของ สไตรีน และอะครีโลไนไตรลโมโนเมอร์ ความเข้มข้นของสารก่ออิมัลชัน และ อุณหภูมิของปฏิกิริยา ผลคือศึกษาหาประสิทธิภาพการกราฟต์และสัดส่วนการกราฟต์ของยางธรรมชาติกราฟต์ซึ่งหาได้โดยการสกัดด้วยตัวทำละลายที่เหมาะสม และ หาเปอร์เซ็นต์การเปลี่ยนแปลง น้ำหนักโมเลกุลของ SAN ปริมาณและความถี่ของการเกิดสายโซ่กราฟต์บนโซ่หลักของยางธรรมชาติหาได้โดยเทคนิค GPC โครงสร้างทางเคมีของโคโพลิเมอร์ที่สังเคราะห์ได้ ตรวจสอบด้วยเครื่องอินฟราเรดสเปกโทรสโกปีและเครื่องวิเคราะห์ธาตุ CHNO สมบัติทางความร้อนของยางธรรมชาติกราฟต์ทดสอบด้วยเครื่อง DSC

การเตรียมพลาสติกผสมเป็นวิธีการหนึ่งที่มีความนิยมสูงเพื่อผลิตเป็นพลาสติกชนิดใหม่ที่มีสมบัติเฉพาะ ในงานวิจัยนี้เป็นการผสมยางธรรมชาติกราฟต์ กับ SAN โดยทำการศึกษาผลของอัตราส่วนของยางธรรมชาติกราฟต์และ SAN ที่มีต่อสมบัติเชิงกลต่างๆ ได้แก่ ความทนแรงกระแทก ความทนต่อการบิดงอ ความต้านแรงดึง ความแข็ง ดัชนีการไหล และ อุณหภูมิการบิดเบือนด้วยความร้อน



ภาควิชา สหสาขาวิชาปิโตรเคมี-โพลีเมอร์
สาขาวิชา วิทยาศาสตร์โพลีเมอร์
ปีการศึกษา 2538

ลายมือชื่อนิติ
ลายมือชื่ออาจารย์ที่ปรึกษา
ลายมือชื่ออาจารย์ที่ปรึกษาร่วม
.....

#C685143 : MAJOR POLYMER SCIENCE
KEY WORD:

STYRENE / ACRYLONITRILE / GRAFT NATURAL RUBBER / EMULSION
POLYMERIZATION

CHALOAMPOL RUJINIRUN : PREPARATION OF GRAFT COPOLYMER OF
STYRENE AND ACRYLONITRILE ONTO NATURAL RUBBER, THESIS ADVISOR:
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Process for the preparation of copolymer of styrene and acrylonitrile on natural rubber latex has been studied. The graft copolymerization was carried out varying concentration of styrene and acrylonitrile monomers, emulsifier concentration and reaction temperature. The grafting efficiency and graft ratio of graft natural rubber determined by solvent extraction technique and degree of conversion were studied and discussed. The molecular weight of free SAN and the frequency of graft chain on backbone rubber were determined by the gel permeation chromatography (GPC) technique. The copolymer composition was determined by Infrared spectroscopy (FTIR) and elemental analyzer. The thermal property of graft natural rubber was determined by differential scanning calorimetry (DSC).

Blending is widely employed as a simple and practical means of obtaining new materials with special properties. The blends of graft natural rubber and SAN were formulated. The effect of graft natural rubber and SAN ratio on Izod impact strength, flexural strength, tensile strength, hardness, melt flow index and heat distortion temperature were investigated.

ภาควิชา..... สอนสาขาวิชาปิโตรเคมี-โพลีเมอร์
สาขาวิชา..... วิทยาลัยเทคโนโลยีโกลด์เฟอว์
ปีการศึกษา..... 2538

ลายมือชื่อนิสิิต.....
ลายมือชื่ออาจารย์ที่ปรึกษา.....
ลายมือชื่ออาจารย์ที่ปรึกษาร่วม.....



ACKNOWLEDGMENT

The author would like to express his sincere thank to advisor, Associate Professor Pattarapan Prasassarakich, Ph.D. and co-advisor, Assistant Professor Nipon Wongvisetsirikul, Ph. D., Mr. Patipol Tadakorn, for their encouraging guidance, supervision and helpful suggestion throughout this research. In addition, he is also grateful to Associate Professor Supawan Tantayanon, Ph.D. and Assistant Professor Amorn Petsom, Ph.D., for serving as chairman and members of thesis committee, respectively, whose comments have been especially valuable.

He also thanks for the research financial supports from Chulalongkorn University and many thanks are going to the Department of Chemistry, King Mongkut Institute of Technology (KMIT) and UNDP/IAEA Regional Industrial Project Office of Atomic Energy for Peace for their hospitality in providing equipments, glasswares and chemicals. Many thanks are going to Thai Petrochemical Industrial Public Company Limited (TPI Group) who provided the SAN resin for the research work and the mechanical properties measurement.

Thanks go towards everyone who has contributed suggestions and supports though out this work. Finally, he owes very deep and thanks to his family for their love, support and encouragement.

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ABBREVIATIONS

ABS	:	Acrylonitrile butadiene styrene copolymer
AN	:	Acrylonitrile monomer
b.p.	:	Boiling point
CHN\O	:	Carbon hydrogen nitrogen and oxygen
DMF	:	Dimethylformamide
DSC	:	Differential scanning calorimetry
FTIR	:	Fourier transform infrared spectroscopy
GPC	:	Gel permeation chromatography
LPE	:	Light petroleum ether
MEK	:	Methyl ethyl ketone
MFI	:	Melt flow index
\bar{M}_n	:	Number-average molecular weight
\bar{M}_w	:	Weight-average molecular weight
\bar{M}_z	:	z-average molecular weight
\bar{M}_w/\bar{M}_n	:	Polydispersity of polymer
NMR	:	Nuclear magnetic resonance
PS	:	Polystyrene
PMMA	:	Polymethylmethacrylate
SAN	:	Styrene acrylonitrile copolymer
SEM	:	Scanning electron microscope
TEM	:	Transmission electron microscope
TGA	:	Thermal gravimetric analysis
THF	:	Tetrahydrofuran
T_g	:	Glass transition temperature
U.V.	:	Ultraviolet