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**ENHANCED GRAFT COPOLYMERIZATION OF STYRENE AND
ACRYLONITRILE ONTO NATURAL RUBBER**



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ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย
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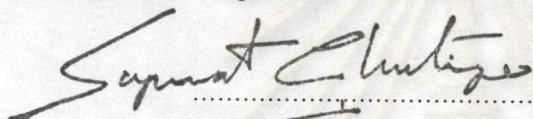
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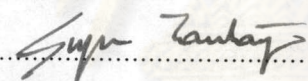
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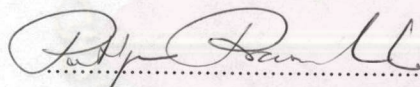
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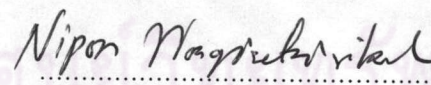
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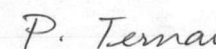
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พัชรินทร์ ดินธุระห์ : การเพิ่มประสิทธิภาพกราฟต์โคโพลิเมอร์เซชันของสไตรีนและอะครีโลไนไตรลบนยางธรรมชาติ (ENHANCED GRAFT COPOLYMERIZATION OF STYRENE AND ACRYLONITRILE ONTO NATURAL RUBBER) อ.ที่ปรึกษา :

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งานวิจัยนี้เป็นการศึกษาผลของความเข้มข้นของตัวริเริ่ม, อุณหภูมิและความดันที่มีต่อปฏิกิริยากราฟต์โคโพลิเมอร์เซชันของสไตรีนและอะครีโลไนไตรลบนยางธรรมชาติเหลว ผลคือศึกษาประสิทธิภาพการกราฟต์, สัดส่วนการกราฟต์ของกราฟต์ยางธรรมชาติ ซึ่งหาได้โดยการสกัดด้วยตัวทำละลายที่เหมาะสมและหาเปอร์เซ็นต์การเปลี่ยนน้ำหนักโมเลกุลของ SAN อิสระ และความถี่ของการเกิดสายโซ่กราฟต์บนโซ่หลักของยางหาได้โดยเทคนิค GPC องค์ประกอบต่าง ๆ ของโคโพลิเมอร์ที่สังเคราะห์ได้ตรวจสอบด้วยเทคนิคอินฟราเรดสเปกโทรสโกปีและการวิเคราะห์ธาตุ CHN/O จากการศึกษาพบว่าสภาวะที่เหมาะสมในการเตรียมกราฟต์ยางธรรมชาติ คือ สภาวะที่ใช้โมโนเมอร์ 100 ส่วนโดยน้ำหนักต่อ 100 ส่วนโดยน้ำหนักของยางธรรมชาติ, ความเข้มข้นของตัวริเริ่ม 1.5 ส่วนโดยน้ำหนัก, อุณหภูมิ 70 °C และความดัน 30 psig เป็นเวลา 8 ชั่วโมง

ในงานวิจัยนี้มีการเตรียมพลาสติกผสมของกราฟต์ยางธรรมชาติกับ SAN เพื่อศึกษาผลของอัตราส่วนของกราฟต์ยางธรรมชาติและ SAN ต่อสมบัติเชิงกลต่าง ๆ ได้แก่ ความต้านแรงดึง, ความทนแรงกระแทกและความแข็ง

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

ภาควิชา
สาขาวิชา
ปีการศึกษา

ลายมือชื่อนิสิต
ลายมือชื่ออาจารย์ที่ปรึกษา
ลายมือชื่ออาจารย์ที่ปรึกษาร่วม

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KEY WORD:

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PATCHAREEPORN SINTOORAHAT : ENHANCED GRAFT

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ONTO NATURAL RUBBER. THESIS ADVISOR : PROF. PATTARAPAN

PRASASSARAKICH, Ph.D., THESIS CO-ADVISOR : ASSIST. PROF. NIPON

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The effect of initiator concentration, reaction temperature and pressure on graft copolymerization of styrene and acrylonitrile onto natural rubber latex were studied. The grafting efficiency and graft ratio of the grafted natural rubber determined by solvent extraction technique and degree of monomers conversion were studied and discussed. The molecular weight of free SAN (styrene-acrylonitrile copolymer) 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 (FT-IR) and CHN/O analysis. The optimum conditions were 100 parts by weight of monomer per 100 parts by weight of natural rubber latex, the initiator concentration of 1.5 parts by weight and temperature and pressure of 70 °C and 30 psig for 8 hours.

The blends of grafted natural rubber and SAN were investigated. The effect of grafted natural rubber and SAN ratio on tensile strength, impact strength, and hardness were investigated.

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ลายมือชื่อนิสิต..... พิศิษา สินธุรังษี

ลายมือชื่ออาจารย์ที่ปรึกษา.....

ลายมือชื่ออาจารย์ที่ปรึกษาร่วม..... Nipon Wongwisetsirikul

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ศูนย์วิทยุโทรพยากร
จุฬาลงกรณ์มหาวิทยาลัย

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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
M_n	:	Number-average molecular weight
M_w	:	Weight-average molecular weight
M_z	:	z-average molecular weight
M_w/M_n	:	Polydispersity of polymer
PS	:	Polystyrene
psig	:	pound per square inches gauge
PMMA	:	Polymethylmethacrylate
SAN	:	Styrene acrylonitrile copolymer
SEM	:	Scanning electron microscope
TEM	:	Transmission electron microscope
THF	:	Tetrahydrofuran
T_g	:	Glass transition temperature
U.V.	:	Ultraviolet