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ศูนย์วิทยทรัพยากร

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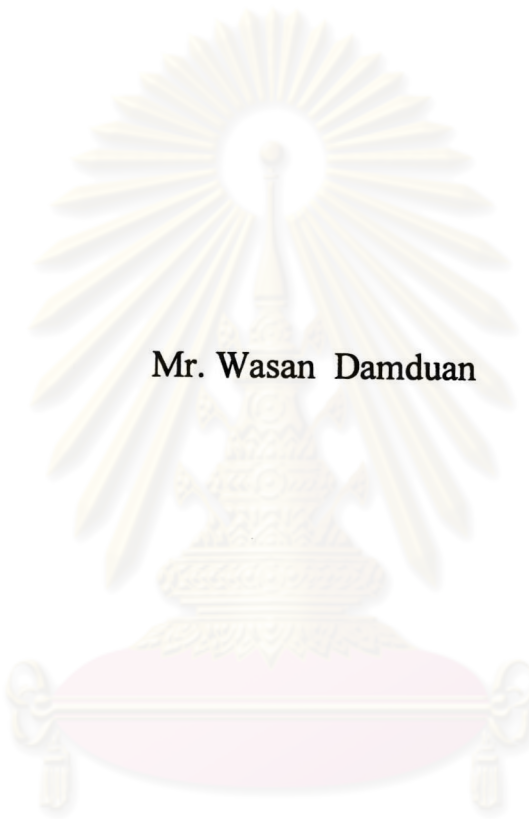
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**DIMERIZATION OF METHYL OLEATE USING THAI CLAYS AS
CATALYST**

Mr. Wasan Damduan



ศูนย์วิทยทรัพยากร
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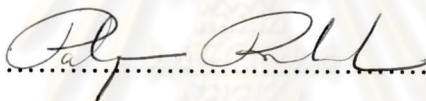
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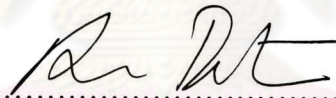


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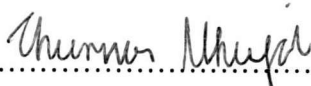
.....Thesis Advisor
(Associate Professor Amorn Petsom, Ph.D.)



.....Member
(Professor Sophon Roengsumran, Ph.D.)



.....Member
(Assistant Professor Warinthorn Chavasiri, Ph.D.)



.....Member
(Thumnoon Nhujak, Ph.D.)

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ได้ศึกษาการเกิดไคเมอไรเซชันของเมทิลโอเลเอต โดยใช้ดินในประเทศไทย 3 ชนิดเป็น
 ตัวเร่งปฏิกิริยา ได้แก่ แทลคัม ดินขาว และ บอลเคลย์ ที่ผ่านการปรับสภาพดินด้วยกรด โดยภาวะที่
 เหมาะสมในการเกิดไคเมอไรเซชันของเมทิลโอเลเอต คือ ที่อุณหภูมิ 25 องศาเซลเซียส เป็นเวลา
 4 ชั่วโมง ปริมาณดิน 25 เปอร์เซ็นต์โดยน้ำหนัก พบว่าแทลคัมให้ค่าประสิทธิภาพในการเกิด
 ไคเมอร์แบบพันธะคาร์บอนกับคาร์บอน (17.20 เปอร์เซ็นต์) ดีกว่าดินชนิดอื่น พิสูจน์เอกลักษณ์
 ไคเมอร์ที่ได้โดยการวิเคราะห์ด้วยเทคนิคทางสเปกโทรสโกปี ได้แก่ อินฟราเรดสเปกโทรสโกปี
 นิวเคลียร์แมกเนติกเรโซแนนซ์สเปกโทรสโกปี และเมทริกซ์เอสซิสเตดเลเซอร์ดีซอร์พชันไอออ
 นเซชันแมสสเปกโทรเมตรี อย่างไรก็ตามความสามารถในการเกิดไคเมอร์ยังน้อยอยู่ จึงได้
 ทำการศึกษาการเกิดไคเมอไรเซชันของเมทิลโอเลเอตโดยใช้โคบอลต์แนฟทีเนต และ เทอเชียร์
 บิวทิลไฮโดรเปอร์ออกไซด์เป็นตัวเร่งปฏิกิริยาร่วม โดยภาวะที่เหมาะสมในการเกิดไคเมอไรเซชัน
 ของ เมทิลโอเลเอต คือ ที่อุณหภูมิ 60 องศาเซลเซียส เป็นเวลา 24 ชั่วโมง ปริมาณดิน 15 เปอร์เซ็นต์
 โดยน้ำหนัก เทอเชียร์บิวทิลไฮโดรเปอร์ออกไซด์ 1.5 เปอร์เซ็นต์โดยน้ำหนัก และ โคบอลต์แนฟที
 เนต 0.05 เปอร์เซ็นต์โดยน้ำหนัก พบว่าค่าการเกิดไคเมอร์แบบพันธะคาร์บอนกับคาร์บอน (35.28
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Three types of Thai clays, namely talcum, china and ball clay were used as catalyst for the dimerization of methyl oleate. The efficiencies of acid activated clays for dimer formation were investigated. The suitable condition for dimerization of methyl oleate was obtained at 250 °C, 4 hours and 25 %wt clay. Talcum showed higher carbon-carbon linked dimer formation (17.20%) than did other clays. The synthesized dimers were identified by spectroscopic techniques, such as infrared spectroscopy, nuclear magnetic resonance spectroscopy and matrix-assisted laser desorption ionization mass spectrometry. However, its dimerization capacity was not good. Therefore, dimerization of methyl oleate using cobalt naphthenate and *tert*-butylhydroperoxide as cocatalyst was studied. The suitable condition for dimerization of methyl oleate was observed at 60 °C, 24 hours, 15%wt clay, 1.5%wt *tert*-butylhydroperoxide and 0.05%wt cobalt naphthenate. It was found that carbon-carbon linked dimer formation (35.28%) was better than those using clay alone (17.20%).

Field of study. Petrochemistry and Polymer Science Student's signature *Wasan Damduan*
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ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

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LIST OF ABBREVIATIONS AND SYMBOLS

^{13}C -NMR	Carbon-13 Nuclear Magnetic Resonance
^1H -NMR	Proton Nuclear Magnetic Resonance
FT-IR	Fourier Transform Infrared Spectrophotometer
XRD	X-ray Powder Diffractometer
$^{\circ}\text{C}$	Degree Celsius
CDCl_3	Deuteriochloroform
ml	milliliter (s)
mg	milligram (s)
min	minute (s)
cm^{-1}	Unit of wave number
%wt	weight percent
%yield	yield percent
MALDI	Matrix-Assisted Laser Desorption Ionization
TOF	Time of Flight
TLC	Thin Layer Chromatography
R_f	Retardation factor Chromatography
δ	Chemical shift
MS	Mass spectrometry
m/z	mass to charge ratio
TBHP	<i>tert</i> -Butyl hydroperoxide
w/v	Weight by volume