

การสังเคราะห์พอลิยูรีเทนที่มีสารประกอบเชิงซ้อน 4,4'-ไดไฮดรอกซีซาลิไซโคลเฮกเซน
ของแมงกานีสและนิกเกิล



นางสาว ชญาภา ใจน้อม

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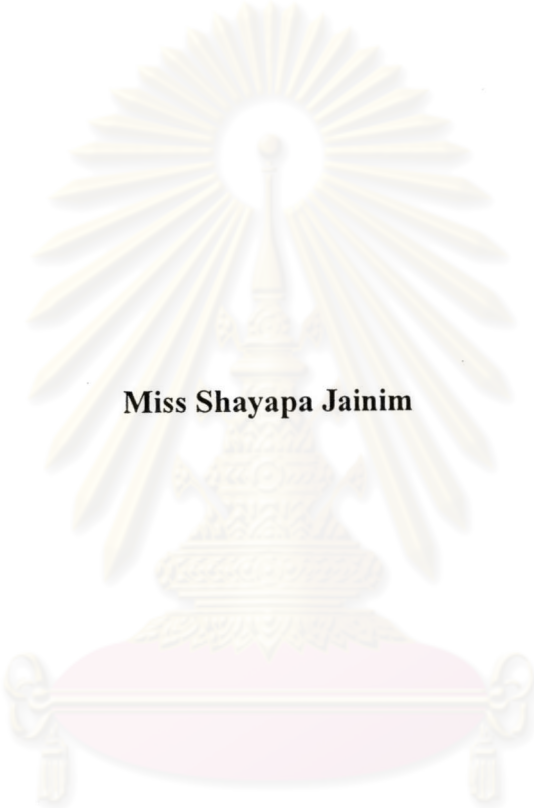
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**SYNTHESIS OF POLYURETHANES CONTAINING MANGANESE AND
NICKEL 4,4'-DIHYDROXYSALICYCLOHEXANE COMPLEXES**



Miss Shayapa Jainim

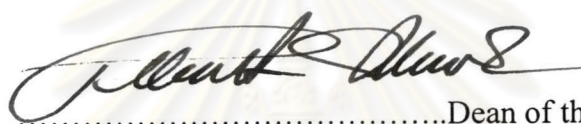
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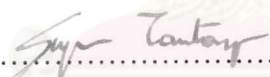
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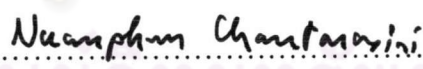
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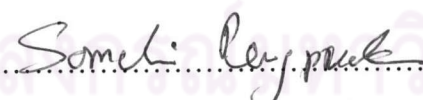
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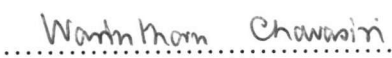

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ชญาภา ใจนั่ม : การสังเคราะห์พอลิยูรีเทนที่มีสารประกอบเชิงซ้อน 4,4'-ไดไฮดรอกซีซาลไซโคลเฮกเซนของแมงกานีสและนิกเกิล. (SYNTHESIS OF POLYURETHANES CONTAINING MANGANESE AND NICKEL 4,4'-DIHYDROXYSALCYCLOHEXANE COMPLEXES) อ.ที่ปรึกษา : รศ.ดร.นवलพรรณ จันทร์ศิริ, 64 หน้า. ISBN 974-17-6985-7.

ได้สังเคราะห์สารประกอบเชิงซ้อน 4,4'-ไดไฮดรอกซีซาลไซโคลเฮกเซนเพนทาเอิน (ML_1) จาก 2,4-ไดไฮดรอกซีเบนซาลดีไฮด์ โลหะแอสเทต (แมงกานีสและโคบอลต์) และเพนทาเอทิลีนเฮกซามีน พบว่าความบริสุทธิ์ของสารที่สังเคราะห์ได้นั้นไม่ดีพอที่จะนำไปใช้ในการสังเคราะห์พอลิเมอร์ จึงได้สังเคราะห์สารประกอบเชิงซ้อนตัวใหม่คือ 4,4'-ไดไฮดรอกซีซาลไซโคลเฮกเซน (ML_2) ซึ่งสังเคราะห์ได้จาก 2,4-ไดไฮดรอกซีเบนซาลดีไฮด์ โลหะแอสเทต (แมงกานีสและนิกเกิล) และ 1,2-ไดเอมีโนไซโคลเฮกเซน ได้ตรวจสอบสารประกอบเชิงซ้อนของโลหะ ML_2 ด้วยเทคนิคอินฟราเรดสเปกโทรสโกปี วิเคราะห์หาธาตุองค์ประกอบและมวลดีทอปแมสสเปกโทรเมทรี พอลิยูรีเทนที่มีโลหะเป็นส่วนประกอบสามารถสังเคราะห์ได้จากปฏิกิริยาระหว่างสารประกอบเชิงซ้อนโลหะ ML_2 และไอโซไซยานาตเทอมีเนตพรีพอลิเมอร์โดยใช้ไดบิวทิลทินไดออกไซด์เป็นตัวเร่งปฏิกิริยา พรีพอลิเมอร์ที่ใช้คือ โทไลลีน 2,4-ไดไอโซไซยานาต เทอมีเนต พอลิบิวเทนไดออกไซด์ น้ำหนักโมเลกุล 900 และ โทไลลีน 2,4-ไดไอโซไซยานาต เทอมีเนต พอลิพรอพิลีนไกลคอล น้ำหนักโมเลกุล 1000 การพิสูจน์เอกลักษณ์พอลิยูรีเทนที่มีโลหะเป็นส่วนประกอบทำได้โดยเทคนิคอินฟราเรดสเปกโทรสโกปี สมบัติการทนความร้อนตรวจสอบได้ด้วยเทอร์โมกราวิเมตริกอนาลิซิส (TGA) จากผลการทดลองพบว่าพอลิยูรีเทนที่มีโลหะเป็นส่วนประกอบแสดงสมบัติการทนความร้อนได้ดี

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

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4,4'-Dihydroxysalpentan metal complex (ML_1) was synthesized from 2,4-dihydroxybenzaldehyde, metal (II) acetate, where M were Mn^{2+} and Co^{2+} , and pentaethylenhexamine. The purity of these synthesized complexes was not good and therefore they were not used in the polymer synthesis. Then, the new metal complex, 4,4'-dihydroxysalicyclohexane metal complex (ML_2), was chosen. ML_2 was synthesized from the reaction between 2,4-dihydroxybenzaldehyde, metal (II) acetate, where M were Mn^{2+} and Ni^{2+} , and 1,2-diaminocyclohexane. ML_2 was characterized by IR spectroscopy, elemental analysis and MALDI-TOF MS. Metal-containing polyurethanes have been synthesized by the reaction between ML_2 and isocyanate-terminated prepolymers with dibutyltin dilaurate as a catalyst. The isocyanate-terminated prepolymers used were tolylene 2,4-diisocyanate terminated poly(1,4-butanediol) (PB), MW 900 and tolylene 2,4-diisocyanate terminated poly(propylene glycol) (PP), MW 1000. Characterizations of polymers were carried out using IR spectroscopy. Thermal stability was studied by thermogravimetric analysis (TGA). It was found that metal-containing polyurethanes showed good thermal stability.

Field of study.....Petrochemistry and Polymer Science.....Student's signature.....Shayapa Jainim.....
Academic year.....2004.....Advisor's signature.....Nuamphun Chantarasiri.....

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LIST OF SYMBOLS AND ABBREVIATIONS

EA	Elemental analysis
MALDI-TOF MS	Matrix-assisted laser desorption ionization-time of flight mass spectra
ML ₁	4,4'-Dihydroxysalpentaen metal complexes
ML ₂	4,4'-Dihydroxysalcyclohexane metal complexes
M-PB	Metal-containing polyurethane synthesized from ML ₂ and PB
M-PP	Metal-containing polyurethane synthesized from ML ₂ and PP
M-PB-X	Metal-containing polyurethane-urea synthesized from ML ₂ , PB and <i>m</i> -xylylenediamine
M-PP-X	Metal-containing polyurethane-urea synthesized from ML ₂ , PP and <i>m</i> -xylylenediamine
PB	Tolylene 2,4-diisocyanate terminated poly(1,4-butanediol) prepolymer (MW 900)
PP	Tolylene 2,4-diisocyanate terminated poly(propylene glycol) prepolymer (MW1000)
PB-X	Polyureas without metal in the main chain synthesized from PB and <i>m</i> -xylylenediamine
PP-X	Polyureas without metal in the main chain synthesized from PP and <i>m</i> -xylylenediamine
TGA	Thermogravimetric analysis