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ไซโคเดอกรีทิน-เฟอร์โรซีนเอมีน**

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**PREPARATION AND CATALYTIC PROPERTY OF
CYCLODEXTRIN - FERROCENYLAMINE INCLUSION COMPOUNDS**



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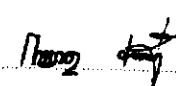
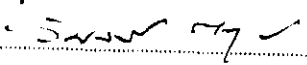
การระกอดเทศศรึ : การเตรียมและสมบัติการเร่งปฏิกิริยาของสารประกอบอินคฤขันไซโคลเดคซ์ทริน-เฟอร์โรซีนิกเอมีน (PREPARATION AND CATALYTIC PROPERTY OF CYCLODEXTRIN-FERROCENYLAMINE INCLUSION COMPOUNDS) อ. ที่ปรึกษา : รศ. ดร. วิมลรัตน์ ตรีการทฤกษ; 162 หน้า. ISBN 974-332-910-2.

ได้เตรียมอนุพันธ์เฟอร์โรซีนิกเอมีน *N, N*-dimethylaminomethylferrocene, *N, N*-dimethylaminomethylferrocene methiodide, α -methylferrocenylmethylamine, ferrocenylethylamine, diphenylaminomethylferrocene, Schiff base derivative, reduced Schiff base derivative, 6-ferrocenyl-2, 2'-bipyridine, 2-(α , α -diphenylhydroxylmethyl)dimethylaminomethylferrocene และอนุพันธ์เฟอร์โรซีนอื่นๆ คือ acetylferrocene, ferrocenylmethylalcohol และ α -hydroxyethylferrocene ตรวจพิสูจน์เอกลักษณ์ด้วยเทคนิคทางอินฟราเรดและโปรตอนเอ็นเอ็มอาร์

เตรียมสารประกอบอินคฤขันของอนุพันธ์เฟอร์โรซีนและอนุพันธ์ชนิดอื่นๆกับบีตาไซโคลเดคซ์ทริน โดยเติมอนุพันธ์เฟอร์โรซีนิกเอมีนลงในสารละลายน้ำของบีตาไซโคลเดคซ์ทรินที่อุณหภูมิ 60 องศาเซลเซียส ได้เปอร์เซ็นต์ผลได้ 60-75 ตรวจพิสูจน์เอกลักษณ์ของสารประกอบอินคฤขันโดยเทคนิคโปรตอนเอ็นเอ็มอาร์ อินฟราเรด และการเลี้ยวเบนรังสีเอ็กซ์ อัตราส่วนที่หาด้วยการวิเคราะห์ธาตุเป็น 1:1 การวิเคราะห์ทางเทอร์โมเกรวิเมตรีแสดงว่าสารประกอบอินคฤขันเสถียรต่อความร้อน ข้อมูลทางโปรตอนเอ็นเอ็มอาร์แสดงให้เห็นว่าแรงกระทำระหว่างอนุพันธ์เฟอร์โรซีนิกเอมีนเกิดอินคฤขัน ดีฟแฟรกโตแกรมของรังสีเอ็กซ์ของสารประกอบอินคฤขันต่างจากของของผสมในชุดเดียวกัน ศึกษาความสามารถในการเร่งปฏิกิริยาของอนุพันธ์เฟอร์โรซีนิกเอมีนที่เตรียมได้ในแอคคิเลชันของเบนซิลดีไฮด์ด้วยโคเอทิลซิงค์ ได้ผลได้ปานกลางถึงสูง (45-96%) แต่มีความเลือกจำเพาะทางอีนันทิโอเมอร์ต่ำ ในทางตรงกันข้ามสารประกอบอินคฤขันให้ผลได้ที่ต่ำ (37-54%) แต่มีความเลือกจำเพาะทางอีนันทิโอเมอร์ที่สูงกว่า

สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

ภาควิชา เคมี
สาขาวิชา เคมี
ปีการศึกษา 2542

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ลายมือชื่ออาจารย์ที่ปรึกษา 
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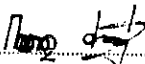

β -CYCLODEXTRIN / FERROCENYLAMINE / ALKYLATION

KARAKED TEDSREE : PREPARATION AND CATALYTIC PROPERTY OF CYCLODEXTRIN-FERROCENYLAMINE INCLUSION COMPOUNDS. THESIS ADVISOR : ASSOC. PROF. WIMONRAT TRAKARNPRUK, Ph.D. 162 pp. ISBN 974-332-910-2.

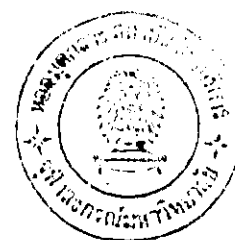
Ferrocenylamines : *N, N*-dimethylaminomethylferrocene, *N, N*-dimethylaminomethyl ferrocene methiodide, α -methylferrocenylmethylamine, ferrocenylethylamine, *N, N*-diphenylamino methylferrocene, Schiff base derivative, reduced Schiff base derivative, 6-ferrocenyl-2, 2'-dipyridine, 2-(α, α -diphenylhydroxylmethyl)dimethylaminomethylferrocene and other ferrocenyl derivatives: acetylferrocene, ferrocenylmethylalcohol, α -hydroxyethylferrocene were prepared and characterized by FTIR and ^1H NMR technique.

The inclusion compounds of the above complexes with β -cyclodextrin can be easily prepared 60-75 percent yields by adding ferrocenyl derivatives directly to an aqueous β -cyclodextrin solution at 60°C. The inclusion compounds were characterized by ^1H NMR, IR and X-ray diffraction techniques. Stoichiometries were determined by elemental analyses to be 1:1. Thermogravimetric analyses showed that inclusion compounds are thermally stable. ^1H NMR data indicate that the interaction between cyclodextrin and ferrocenyl derivative is a real inclusion phenomenon. X-ray diffractograms of the inclusion compounds were different from those of the corresponding mixtures. The synthesized ferrocenylamine derivatives were studied for the catalytic activity in the alkylation of benzaldehyde with diethylzinc. Moderate to high yields (45-96%) but low enantioselectivities were obtained. On the contrary, the inclusion compounds gave lower yields (37-54%) with higher enantioselectivities.

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ลายมือชื่ออาจารย์ที่ปรึกษา..... 
ลายมือชื่ออาจารย์ที่ปรึกษาร่วม.....

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LIST OF ABBREVIATIONS

°C	degree Celcius
cm ⁻¹	unit of wavenumber
mL	millilitre
hr	hour
¹ H NMR	Proton nuclear magnetic resonance
δ	chemical shift (ppm)
J	coupling constant (Hz)
s	singlet
d	doublet
t	triplet
m	multiplet
dd	doublets of doublet
ddd	doublets of doublets of doublet
td	triplets of doublet
CDCl ₃	deuteriochloroform
DMSO-d ₆	methyl sulfoxide-d ₆
ppm	parts per million
FTIR	Fourier transform infrared
br	broad (IR)
s	strong (IR)
m	medium (IR)
w	weak (IR)
UV-vis	Ultraviolet-visible
λ _{max}	wavelength at maximum absorption
ε	molar absorptivity
m/z	mass per charge
Fc	ferrocene
CD	cyclodextrin

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