

ความเป็นเบสของสารประกอบคาติก[4]ซารีนและเสถียรภาพของการเกิด  
สารประกอบเชิงซ้อนกับไอออนโลหะในเมทานอล

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**BASICITY OF TRIAZA BENZO CROWN-*P-TERT*-BUTYLCALIX [4]ARENE  
AND STABILITY OF ITS METAL COMPLEXES IN METHANOL**

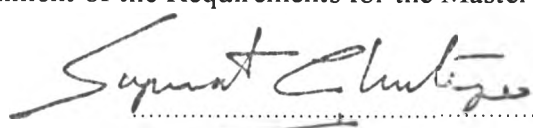
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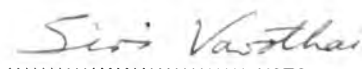
**Thesis Title**            Basicity of triaza benzo crown-*p-tert*-butylcalix[4]arene and stability of its metal complexes in methanol  
**By**                            Mr. Akapong Suwattanamala  
**Department**            Chemistry  
**Thesis Advisor**        Associate Professor Vithaya Ruangpornvisuti, Dr. rer. nat.


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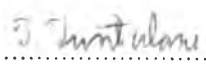
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เอกพงษ์ สุวัฒน์มาลา : ความเป็นเบสของสารประกอบคาลิก[4]ซาารีนและเสถียรภาพของการเกิด  
สารประกอบเชิงซ้อนกับไอออนโลหะในเมทานอล (BASICITY OF TRIAZA BENZO CROWN-*P-TERT*-  
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การศึกษาคือความเป็นเบสของสารประกอบ 25,27-[2,2'-(2,2'-((2,5,8-triaza)nonyl)diphenoxy]  
diethyl)-*p-tert*-butylcalix[4]arene (L) และการเกิดสารประกอบเชิงซ้อนกับไอออนโลหะแทรนซิชัน ( $M^{2+}$ )  
โคบอลต์ นิกเกิล ทองแดง และ สังกะสี ที่อุณหภูมิ 25 °C โดยวิธีโพเทนชิโอเมตริกไทเทรชัน ค่าคงที่การ  
รับโปรตอนของสารประกอบลิแกนด์ L ในสารละลาย  $5.0 \times 10^{-2}$  M  $Et_4NClO_4$  และ  $5.0 \times 10^{-2}$  M  
 $Bu_4NCF_3SO_3$  ในเมทานอล พบว่ามีค่าคงที่การรับโปรตอนจำนวนสามค่า โดยค่าคงที่การรับโปรตอนจำนวน  
สามค่าในสารละลายเมทานอลของ  $5.0 \times 10^{-2}$  M  $Et_4NClO_4$  มีค่าสูงกว่า ในสารละลายเมทานอลของ  
 $5.0 \times 10^{-2}$  M  $Bu_4NCF_3SO_3$  ในการศึกษาเสถียรภาพของการเกิดสารประกอบเชิงซ้อนของ L กับไอออนโลหะ  
แทรนซิชันในสารละลายเมทานอลของ  $5.0 \times 10^{-2}$  M  $Bu_4NCF_3SO_3$  พบว่าเกิดสารประกอบเชิงซ้อน  $ML^{2+}$  กับ  
ไอออนโลหะโคบอลต์, นิกเกิล, ทองแดง และ สังกะสี โดยมีการเลือกจำเพาะกับไอออนโลหะ เรียงลำดับ  
ดังนี้ ทองแดง > นิกเกิล > โคบอลต์ > สังกะสี ส่วนสารประกอบเชิงซ้อนกับไอออนโลหะทองแดงและ  
สังกะสี สามารถเกิดเป็น  $CuL(OCH_3)^+$  และ  $ZnL^{++}$  ตามลำดับ

ภาควิชา ..... เคมี  
สาขาวิชา ..... เคมี  
ปีการศึกษา ..... 2540

ลายมือชื่อนิสิต ..... เอกพงษ์ สุวัฒน์มาลา  
ลายมือชื่ออาจารย์ที่ปรึกษา .....  
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KEY WORD: BASICITY / POTENTIOMETRIC TITRATION / PROTONATION CONSTANTS / STABILITY / SPECIES

AKAPONG SUWATTANAMALA : BASICITY OF TRIAZA BENZO CROWN-*P*-*TERT*- BUTYLCALIX[4]ARENE. THESIS ADVISOR : ASSOC. PROF. VITHAYA RUNGPNORNVISUTI, Dr. rer. nat 81 pp. ISBN 974-637-451-6.

Basicity study of 25,27-{2,2'-[2,2'-((2,5,8-triaza)nonyl)diphenoxy]diethyl}-*p*-*tert*-butylcalix[4]arene (L) and stability of its complexes with transition metal ions ( $M^{2+}$ ), including  $Co^{2+}$ ,  $Ni^{2+}$ ,  $Cu^{2+}$  and  $Zn^{2+}$  were investigated at 25°C by potentiometric titration method. Three protonation constants of the ligand L, in the methanolic solution of  $5.0 \times 10^{-2}$  M  $Et_4NClO_4$  and  $5.0 \times 10^{-2}$  M  $Bu_4NCF_3SO_3$  were obtained. The three protonation constants in the methanolic solution of  $5.0 \times 10^{-2}$  M  $Et_4NClO_4$  were larger than those in the methanolic solution of  $5.0 \times 10^{-2}$  M  $Bu_4NCF_3SO_3$ . The order of magnitude of the stability of the ligand L complexes with the  $Co^{2+}$ ,  $Ni^{2+}$ ,  $Cu^{2+}$  and  $Zn^{2+}$  in the methanolic solution of  $5.0 \times 10^{-2}$  M  $Bu_4NCF_3SO_3$  found as  $ML^{2+}$  species, decreases from  $Cu^{2+} > Ni^{2+} > Co^{2+} > Zn^{2+}$ . The complex species with the  $Cu^{2+}$  and  $Zn^{2+}$  were formed as  $CuL(OCH_3)^+$  and  $Zn_2L^{4+}$  respectively.

ภาควิชา..... ๑๑๗

สาขาวิชา..... ๑๑๗

ปีการศึกษา..... ๒๕๔๐

ลายมือชื่อนิสิต..... ๑๑๗๑๗๗ ๑๑๗๑๗๗๗

ลายมือชื่ออาจารย์ที่ปรึกษา.....

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Akapong Suwattanamala

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## LIST OF ABBREVIATIONS

°C	degree Celcius
conc	concentrated
<sup>1</sup> H NMR	Proton Nuclear Magnetic Resonance
mmol	millimole
M	molar
mM	millimolar
$\bar{p}$	protonation formation function
$\bar{n}$	complex formation function