

**SUPRAMOLECULAR STRUCTURE OF
N,N-BIS(2-HYDROXYBENZYL)ALKYLAMINE
AND AN APPROACH FOR MACROCYCLIC COMPOUND**

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ABSTRACT

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Keywords: Supramolecular chemistry/ Inclusion phenomena/ Molecular assembly/ *N,N*-Bis(2-hydroxybenzyl)alkylamine/ Host-guest formation/ Macrocyclic compound.

The present dissertation focuses on the molecular design and approaches for *N,N*-bis(2-hydroxybenzyl)alkylamine derivatives based supramolecules. *N,N*-Bis(2-hydroxybenzyl)alkylamine derivatives show an ion interaction with transition metal ions in solution state. *N,N*-Bis(2-hydroxybenzyl)alkylamine derivatives form supramolecular complex with copper ion via a dimeric *N,N*-bis(2-hydroxybenzyl)alkylamine network at the host-guest ratio of 1:1. A single crystal analysis clarifies that the structure of supramolecular complex is responsive for both coordinated charge transfer system with copper guest and hydrogen bond network without guest. *N,N*-Bis(2-hydroxybenzyl)alkylamine derivatives also perform a concerted contribution of coordination and hydrogen bonds which is a unique structure to accept ion species and neutral molecules simultaneously. The reaction of *N,N*-bis(2-hydroxybenzyl)alkylamine with 1,3-bis(tosyloxy)propane under simple condition without adding any template ion selectively gives dibenzo-monoaza-12-crown-3 macrocyclic compound.

บทคัดย่อ

สุทธินันท์ พงษ์ธรรมรักษ์ : โครงสร้างซูปปราโมเลกุลของเอ็น,เอ็น-บิส(2-ไฮดรอกซีเบนซิล)อัลคิลอามีนและกระบวนการนำไปสู่สารวงแหวน (Supramolecular Structure of *N,N*-Bis(2-hydroxybenzyl)alkylamine and an Approach for Macrocyclic Compound) อาจารย์ที่ปรึกษา : รองศาสตราจารย์ ดร. สุวบุญ จิราญชัย และ ศาสตราจารย์ ดร. มิกิจิ มียาตะ 81 หน้า ISBN 974-9937-33-3

งานวิจัยนี้เน้นถึงการออกแบบโมเลกุลและการศึกษาโครงสร้างซูปปราโมเลกุลของอนุพันธ์เอ็น,เอ็น-บิส(2-ไฮดรอกซีเบนซิล)อัลคิลอามีน เอ็น,เอ็น-บิส(2-ไฮดรอกซีเบนซิล)อัลคิลอามีนสร้างอันตรกิริยากับไอออนของโลหะทรานสิชัน เอ็น,เอ็น-บิส(2-ไฮดรอกซีเบนซิล)อัลคิลอามีนก่อตัวเป็นสารเชิงซ้อนซูปปราโมเลกุลกับไอออนทองแดงด้วยเครือข่ายของไดเมอร์เอ็น,เอ็น-บิส(2-ไฮดรอกซีเบนซิล)อัลคิลอามีนในอัตราส่วนสารหลัก-สารรองเท่ากับ 1:1 การศึกษาโครงสร้างผลึกเดี่ยวด้วยรังสีเอกซ์ชี้ให้เห็นว่าโครงสร้างซูปปราโมเลกุลของเอ็น,เอ็น-บิส(2-ไฮดรอกซีเบนซิล)อัลคิลอามีนรองรับทั้งโครงสร้างโคออดิเนตแบบระบบการส่งผ่านประจุกับสารรองของไอออนทองแดงและเครือข่ายพันธะไฮโดรเจนแบบไม่มีสารรอง เอ็น,เอ็น-บิส(2-ไฮดรอกซีเบนซิล)อัลคิลอามีนนี้ยังแสดงการเกิดพันธะโคออดิเนชันและพันธะไฮโดรเจนพร้อมกัน ซึ่งเป็นโครงสร้างเฉพาะในการรองรับไอออนและโมเลกุลที่เป็นกลางในขณะเดียวกัน ปฏิกิริยาระหว่างเอ็น,เอ็น-บิส(2-ไฮดรอกซีเบนซิล)อัลคิลอามีนกับ 1,3-บิส(โทซิลออกซี)โพรเพน ภายใต้อุณหภูมิที่ต่ำ โดยปราศจากไอออนที่เป็นตัวตั้งวงแหวนใดๆ นั้น ทำให้เกิดสารวงแหวนแบบไดเบนโซ-มอนออาซา-12-คราวน์-3

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