

**SUPRAMOLECULAR BENZOXAZINES: A NOVEL TYPE OF
POLYMERIC CHAIN BASED ON HYDROGEN BONDING AND
METALLO-SUPRAMOLECULAR SYSTEM**



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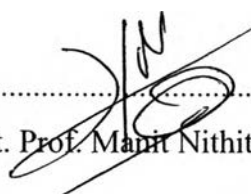
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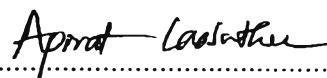
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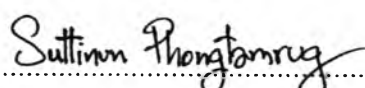
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ABSTRACT

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Pimsai Tanphibal: Supramolecular Benzoxazines: A Novel Type of Polymeric Chain based on Hydrogen Bonding and Metallo-supramolecular System.

Thesis Advisors: Assoc. Prof. Suwabun Chirachanchai, Asst. Prof. Manit Nithitanakul, and Asst. Prof. Apirat Laobuthee 65 pp.

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A novel type of benzoxazine supramolecule, i.e., hydrogen bond network-supramolecule and metallo-supramolecule, is proposed. Diamine-linked benzoxazine dimers prepared by the ring opening reaction of diamine-based benzoxazine monomers are good models for supramolecular assembly via hydrogen bonding and copper metal ion complexation the molecular assembly induces supramolecular polymer chains as evidenced from the viscosity and number of the end group analyzed by viscosity and ^1H NMR techniques. The chain length of diamine is a key factor to form supramolecular polymer via hydrogen bond network and/or metal complexation. The morphology of supramolecular system obtained is unique to be in forms of donut-like, vesicle-like, sphere-like, needle-like, or comb-like depending on the type of diamine and the concentration of benzoxazine dimers.

บทคัดย่อ

พิมพ์สาย ต้นกิบาล : เบนซอกซาซีนซูปราโมเลกุล : พอลิเมอร์ชนิดใหม่แบบซูปราโมเลกุลภายใต้พันธะไฮโดรเจนและระบบโลหะ (Supramolecular Benzoxazines: A Novel Type of Polymeric Chain based on Hydrogen Bonding and Metallo-supramolecular System) อ. ที่ปรึกษา : รองศาสตราจารย์ ดร. สุวบุญ จิรชาณูชัย ผู้ช่วยศาสตราจารย์ ดร. มานิตย์ นิธิธนากุล และ ผู้ช่วยศาสตราจารย์ ดร. อภิรัตน์ เล่าห์บุตรี 65 หน้า

งานวิจัยนี้เสนอเบนซอกซาซีนซูปราโมเลกุลชนิดใหม่ที่เกิดขึ้นภายใต้ร่างแหของพันธะไฮโดรเจนและพันธะกับโลหะเป็นซูปราโมเลกุลาร์พอลิเมอร์ การรวมตัวกันของโมเลกุลก่อให้เกิดซูปราโมเลกุลาร์พอลิเมอร์คั้งขึ้นขึ้นได้จากค่าความหนืดและจำนวนของหมู่ปลายสุดในสายโซ่พอลิเมอร์ที่วิเคราะห์ได้จากเทคนิคการวิเคราะห์ความหนืดและโปรตอนนิวเคลียร์แมกเนติกเรโซแนนซ์ ความยาวของสายโซ่ไดอามีนเป็นปัจจัยหลักในการก่อตัวเป็นซูปราโมเลกุลาร์พอลิเมอร์ด้วยพันธะไฮโดรเจนและด้วยการเป็นคอมเพล็กซ์กับโลหะ มอร์ฟอโลยีของซูปราโมเลกุลที่ได้มีลักษณะจำเพาะในรูปแบบต่างๆ เช่น แบบโคนัท แบบทรงกลมกลวง แบบทรงกลมตัน แบบเข็ม แบบหวี โดยขึ้นอยู่กับประเภทของไดอามีนและความเข้มข้นของเบนซอกซาซีนไดเมอร์ในระบบ

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