

**CHITOSAN-HOBt WATER BASED SYSTEM: AN EFFECTIVE PATHWAY
FOR CHITOSAN CONJUGATING REACTION AND FOR
AEROGEL FORMATION**



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A Thesis Submitted in Partial Fulfilment of the Requirements
for the Degree of Master of Science
The Petroleum and Petrochemical College, Chulalongkorn University
in Academic Partnership with
The University of Michigan, The University of Oklahoma,
and Case Western Reserve University

2008

511986

Thesis Title: Chitosan-HOBt Water Based System: An Effective Pathway
for Chitosan Conjugating Reaction and for Aerogel Formation
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Accepted by the Petroleum and Petrochemical College, Chulalongkorn
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บทคัดย่อ

ธิดารัตน์ พลขมมา: ชื่อหัวข้อวิทยานิพนธ์ (ภาษาไทย) ไคโตซาน-ไฮดรอกซีเบนโซอิกไตรอะโซลในระบบน้ำ: วิธีที่มีประสิทธิภาพสำหรับปฏิกิริยาการคอนจูเกตไคโตซาน และการสร้างแอโรเจล (Chitosan-HOBt Water Based System: An Effective Pathway for Chitosan Conjugating Reaction and for Aerogel Formation) อ. ที่ปรึกษา: รองศาสตราจารย์ ดร. สุวบุญ จิรชาญชัย 50 หน้า

งานวิจัยนี้ได้เสนอการนำไคโตซาน-ไฮดรอกซีเบนโซอิกไตรอะโซลในระบบน้ำเพื่อที่จะเตรียมไคโตซานที่คอนจูเกตกับกรดอะมิโนซึ่งเป็นหมู่ฟังก์ชันของระบบการนำส่งยาแบบกำหนดเป้าหมาย การคอนจูเกตทำได้โดยการใช้ไคโตซานแบบร่างแหที่เตรียมได้จากการดัดแปลงโครงสร้างของไคตินแบบร่างแหกับแอสพาราจีนและทรีปโตเฟนด้วย WSC การวิเคราะห์เชิงคุณภาพและเชิงปริมาณยืนยันได้จากเปอร์เซ็นต์การแทนที่ของแอสพาราจีนและทรีปโตเฟน 25% และ 4% ตามลำดับ หลังจากการระเหิดน้ำแล้วสารทั้งคู่มีลักษณะเป็นโครงสร้างร่างแหคล้ายสำลี งานวิจัยยังได้ขยายขอบเขตถึงการศึกษาไคโตซานนาโนคอมโพสิตแอโรเจลจากไคโตซาน-ไฮดรอกซีเบนโซอิกไตรอะโซลในระบบน้ำด้วยไดคาร์บอกซิลเลตเตด โพลีเอทรีน ไกลคอล แสดงถึงปฏิกิริยาการเชื่อมโยงที่มีประสิทธิภาพที่ได้มาจากไฮโดรเจล การระเหิดผลึกน้ำแข็งทำให้ได้แอโรเจล

ABSTRACT

4772030063: Polymer Science Program

Tidarat Ponyomma: Chitosan-HOBt Water Based System: An Effective Pathway for Chitosan Conjugating Reaction and for Aerogel Formation

Thesis Advisors: Assoc. Prof. Suwabun Chirachanchai 50 pp.

Keywords: Drug targeting / Aerogel Nanocomposite

The present work proposes chitosan-hydroxybenzotriazole (HOBt) water-based system to prepare chitosan conjugated with amino acids which are ideal drug targeting functional groups. The conjugation is demonstrated based on the use of chitosan nanoscaffold prepared from deacetylation of chitin whisker. The conjugation with asparagines and tryptophan is accomplished by using WSC. The qualitative and quantitative analyses confirm the degree of substitution to be 25% and 4% for asparagines and tryptophan, respectively. By simple freeze drying, both derivatives give cotton-like scaffold. The work extends to study chitosan nanocomposite aerogel by using chitosan-HOBt water-based system. The dicarboxylated polyethylene glycol shows effective crosslinking reaction as evidenced from the hydrogel formation. The water exclusion by freeze-drying gives aerogel.

ACKNOWLEDGEMENTS

This thesis work is partially funded by the Petroleum and Petrochemical college; and the National Excellence Centre for Petroleum, Petrochemicals and Advanced Materials, Thailand.

The author would like to give special thanks to her advisor, Associate Professor Suwabun Chirachanchai, who not only originated this work, but also gave her many suggestions, invaluable guidance, constructive criticism, constant encouragement, inspiration and vital help throughout this research work.

She also gratefully thanks Assistant Professor Varawut Tangpasuthadol and Dr. Wanpen Tachaboonyakiat for their valuable comments and discussion as the thesis committees.

She appreciates all Professors who have tendered invaluable knowledge to her at the Petroleum and Petrochemical College, Chulalongkorn University.

She is also indebted to Associate Professor Buncha Pulpoka (Department of Chemistry, Faculty of Science, Chulalongkorn University) for his comments and help in the NMR measurement. She extends her appreciation to Seafresh Chitosan (Lab) Company Limited, Thailand, for their chitosan starting materials.

In addition, she wishes to thank her seniors, especially Dr. Sasiprapa Phongying, Dr. Juthathip Fangkangwanwong, Mr. Puripong Totsatitpaisan for the suggestions and encouragement throughout this research work. She also would like to thank the College staff, and all her friends at Petroleum and Petrochemical College.

Finally, she wishes to express his gratitude to her family for their love, understanding, encouragement, and financial support.

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