

**CHITOSAN-MAGNETITE NANOPARTICLES  
VIA “CLICK” CHEMISTRY**

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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

2011

I 2837468x


**Thesis Title:** Chitosan-magnetite Nanoparticles via “Click” Chemistry  
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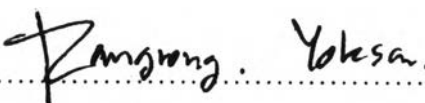
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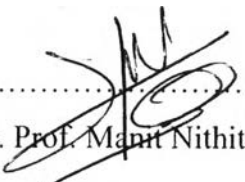
Accepted by The Petroleum and Petrochemical College, Chulalongkorn University, in partial fulfilment of the requirements for the Degree of Master of Science.

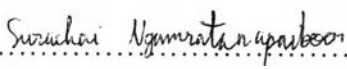
  
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## บทคัดย่อ

อรพรรณ พวงไสว : การเตรียมอนุภาคระดับนาโนไคโตซาน-แมกเนไทต์ด้วยปฏิกิริยาเคมี”คลิก” (Chitosan-magnetite Nanoparticles via “Click” Chemistry) อ. ที่ปรึกษา: ศาสตราจารย์ ดร. สุวบุญ จิระชาญชัย และ ดร. รังรอง ยกसान 45 หน้า

อนุภาคนาโนไคโตซาน-แมกเนไทต์ ได้ถูกนำเสนอภายใต้ปฏิกิริยาคลิกที่ไม่มีคอปเปอร์ไคโตซาน ปรับโครงสร้างด้วยโพรพอกซิลโบรไมด์เพื่อให้ได้อนุพันธ์ของไคโตซาน ขณะที่อนุภาคนาโนแมกเนไทต์เคลือบด้วยไซเลนแล้วตามด้วยการปรับโครงสร้างด้วยไซเดียมเฮไซด์เพื่อให้ได้อนุภาคนาโนแมกเนไทต์ที่พื้นผิวมีหมู่เฮไซด์ อนุพันธ์ไคโตซานที่มีหมู่อัลไคน์และอนุภาคนาโนแมกเนไทต์ที่พื้นผิวมีหมู่เฮไซด์ นำมาต่อกันด้วยปฏิกิริยาคลิกในสภาวะที่ไม่รุนแรงและปราศจากคอปเปอร์เป็นตัวเร่งปฏิกิริยา ขนาดของอนุภาคนาโนไคโตซาน-แมกเนไทต์ ในสารละลายบัฟเฟอร์ที่พีเอชต่างๆ ประมาณ 200 นาโนเมตร และยังมีการกระจายตัวที่ดี การทดสอบการแยกดีเอ็นเอเบื้องต้นด้วยอนุภาคนาโนไคโตซาน-แมกเนไทต์ พบว่าให้ผลในระดับเดียวกันกับในกรณีการใช้ไคโตซาน-แมกเนไทต์ที่ไม่ได้ต่อกันด้วยปฏิกิริยาคลิก

## ABSTRACT

5272016063: Polymer Science Program  
Oraphan Phuangsawai: Chitosan-magnetite Nanoparticles via  
“Click” Chemistry.

Thesis Advisors: Prof. Suwabun Chirachanchai and  
Dr. Rangrong Yoksan 45 pp.

Keywords: Chitosan/ Magnetite nanoparticle/ “Click” chemistry

Chitosan-magnetite nanoparticles are proposed under Cu(I) free “click” chemistry. Chitosan is modified with propargyl bromide to obtain chitosan derivative whereas magnetite nanoparticles are coupled with silane followed by treating with sodium azide to obtain magnetite nanoparticles surface modified with azide group. Both chitosan with alkyne group derivative and magnetite nanoparticles surface modified with azide group are conjugated without Cu(I) catalyst in mild condition under “click” chemistry. The chitosan-magnetite nanoparticles show hydrodynamic radius approximately 200 nm and have a good dispersibility in buffer solution with various pHs. A preliminary study on DNA separation using the chitosan-magnetite nanoparticles via “click” chemistry confirms a similar level as chitosan-magnetite via non “click” chemistry in extracting DNA of *E. coli*.

## ACKNOWLEDGEMENTS

This thesis work is funded by the Petroleum and Petrochemical College; and the National Center of Excellence for Petroleum, Petrochemicals, and Advanced Materials, Thailand.

The author is grateful for the scholarship and funding of the thesis work provided by The Development and Promotion of Science and Technology Talents Project (DPST).

She would like to thank Assoc.Prof. Suwabun Chirachanchai, her advisor for kind suggestion and motivation, for success of the research work.

She would like to deeply thank Dr. Surachai Ngamratnapaiboon from Mahidol University for helpfulness of the bioproperties test.

She appreciates Asst. Prof. Rath Pichyangkura, Head of Chitin Research Center, Chulalongkorn University for the low molecular weight chitosan.

She is deeply thankful the Hitachi-High technology Co., Ltd., Japan for the partial support of TEM instrument to SWB Laboratory.

She thanks the National Nanotechnology Center (NANOTEC), The National Science and Technology Development Agency (NSTDA) of Thailand (Project No. NN-B-2-FN1-10-52-14) for funding.

She is grateful to thank SWB group for a good relationship and helpful in everything during her research work.

Last but not least, she really thanks her family for inspiration, understanding, and financial support.

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