

# CATALYTIC ACTIVITY OF METAL LOADED TITANIA NANOTUBES



Chanakarn Piwuan

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**By:** Chanakarn Piwnuan  
**Program:** Polymer Science  
**Thesis Advisors:** Assoc. Prof. Sujitra Wongkasemjit  
Assoc. Prof. Apanee Luengnaruemitchai  
Asst. Prof. Thanyalak Chaisuwan

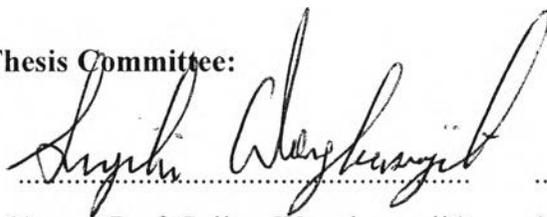
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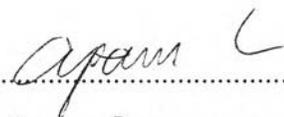


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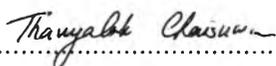
**Thesis Committee:**



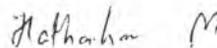
.....  
(Assoc. Prof. Sujitra Wongkasemjit)



.....  
(Assoc. Prof. Apanee Luengnaruemitchai)



.....  
(Asst. Prof. Thanyalak Chaisuwan)



.....  
(Asst. Prof. Hathaikarn Manuspiya)



.....  
(Asst. Prof. Bussarin Ksapabutr)

**ABSTRACT**

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Photocatalytic Activity

Fe- and Cr-doped titania nanotubes were prepared by hydrothermal treatment. After the calcination process, pure TNTs gave the best photocatalytic activity, comparing to M-loaded TNTs. The prepared catalysts were characterized by XRD, TEM, BET, and XRF. The photocatalytic activity of catalysts were evaluated through the photodegradation of methyl orange. When compared to the metal-loaded TNTs, the pure TNTs resulted in photocatalytic activity while the best optimum dopant amount of Fe found to be at 2% and 15% Cr-doped TNTs calcined at 500 °C possessed the best absorption in dark.

## บทคัดย่อ

ชนาگانต์ ผิวนวล : การเร่งปฏิกิริยาของท่อนาโนไททาเนียโดยการเติมโลหะ (Catalytic Activity of Metal Loaded Titania Nanotubes) อ. ที่ปรึกษา: รองศาสตราจารย์ ดร. สุจิตรา วงศ์เกษมจิตต์, รองศาสตราจารย์ ดร. อาภาณี เหลืองนฤมิตชัย และ ผู้ช่วยศาสตราจารย์ ดร. รัชฎ์ญ์ ลักขณ์ ฉายสุวรรณ 40 หน้า

การสังเคราะห์ท่อนาโนไททาเนียโดยการเติมเหล็กและโครเมียมประสบความสำเร็จด้วยวิธีการให้ความร้อนและสามารถพิสูจน์เอกลักษณ์ได้ด้วยเครื่อง XRD, TEM, BET และ XRF การเร่งปฏิกิริยาดำเนินการด้วยแสงของท่อนาโนไททาเนียโดยการเติมโลหะเกิดผ่านปฏิกิริยาการย่อยสลายเมทิลออร์เรนจ์ จากผลการทดลองพบว่าท่อนาโนไททาเนียบริสุทธิ์ให้ประสิทธิภาพของการเร่งปฏิกิริยาดำเนินการด้วยแสงดีที่สุด ในขณะที่ปริมาณของเหล็กและโครเมียมซึ่งถูกเติมลงในท่อนาโนไททาเนียและถูกเผาด้วยอุณหภูมิ 500 องศาเซลเซียสเท่ากับ 2 และ 15 เปอร์เซ็นต์ ตามลำดับ ให้ประสิทธิภาพของการดูดซับในที่มีดีที่สุด

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**ABBREVIATIONS**

TNTs	Titania nanotubes/ Titanium dioxide nanotubes
TEM	Transmission electron microscope
SAA	Surface area analysis
SEM	Scanning electron microscopy
XRD	X-ray diffractometer
XRF	X-ray fluorescence spectrophotometer