

**A NOVEL POLY(VINYL ALCOHOL) POLYMER MEMBRANE FOR  
SEPARATION OF VOLATILE ORGANIC COMPOUNDS (VOCs)**

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A Thesis Submitted in Partial Fulfillment 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

1999

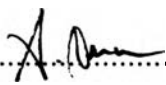
ISBN 974-331-916-6

I19339371


**Thesis Title** : A Novel Poly(vinyl alcohol) Membrane for Separation of Volatile Organic Compounds (VOCs)  
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**Program** : Polymer Science  
**Thesis Advisor** : Professor Erdogan Gulari  
Dr. Suwabun Chirachanchai

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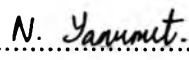
Accepted by the Petroleum and Petrochemical College, Chulalongkorn University, in partial fulfillment of the requirements for the Degree of Master of Science.

  
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## บทคัดย่อ

อมรเทพ คล่องแคล่ว : พอลิไวนิลแอลกอฮอล์เมมเบรนชนิดใหม่เพื่อการแยกสารระเหยอินทรีย์ (A Novel Poly(vinyl alcohol) Polymer Membrane for Separation of Volatile Organic Compounds (VOCs)) อ. ที่ปรึกษา : ศ. ดร. เอกอรรถ เกษม ภูงาโร และ ดร. สุวบุญ จิระชาญชัย 42 หน้า ISBN 974-331-916-6

พอลิไวนิลแอลกอฮอล์ควด้วยไตรเมทิลไซลิคโคลโรซิลโฟเนด (PVA-TMSCS) ถูกสังเคราะห์สำเร็จด้วยการใช้ไฟรีดินเป็นตัวเร่งปฏิกิริยาซึ่งสามารถสังเคราะห์ได้จากพิกที่ตำแหน่งเลขคลื่น 1020 ในฟูเรียร์ทรานสฟอร์มอินฟราเรดสเปกตรัม พอลิไวนิลแอลกอฮอล์ (PVA) และ PVA-TMSCS สามารถเตรียมเป็นเมมเบรนได้โดยใช้วิธีขึ้นรูปด้วยสารละลายซึ่งจะได้เมมเบรนที่มีความหนาประมาณ 0.017 มิลลิเมตร สำหรับ PVA และ 0.021 มิลลิเมตร สำหรับ PVA-TMSCS ซึ่งทำการคำนวณได้จากอินเตอร์เฟียร์เรนฟรินจ์แพทเทินของฟูเรียร์ทรานสฟอร์มอินฟราเรดสเปกตรัม การแพร่ผ่านเมมเบรนของไอของสารละลายอินทรีย์ ได้แก่ เบนซีน ไซโคลเฮกเซน เอทานอล เมทานอล และ ไอโซโพรพานอล สามารถทำได้ทั้งการตรวจสอบวิเคราะห์เชิงปริมาณและคุณภาพโดยการใช้ฟูเรียร์ทรานสฟอร์มอินฟราเรดสเปกตรัมสามมิติ จากการศึกษาการแพร่ผ่านเมมเบรนของไอของสารละลายอินทรีย์ พบว่า อัตราการแพร่ผ่านเมมเบรนที่เตรียมจาก PVA-TMSCS ที่มีต่อเบนซีนและไซโคลเฮกเซน สูงกว่าอัตราการแพร่ผ่านเมมเบรนที่เตรียมจากพอลิไวนิลแอลกอฮอล์ 52 และ 28 เปอร์เซ็นต์ ตามลำดับ

## ABSTRACT

# # 972002 : POLYMER SCIENCE PROGRAM

KEY WORDS : Poly(vinyl alcohol)/ Trimethylsilyl/ Gas Permeability/  
Interference Fringe Pattern

Mr. Amornthep Klongkleaw: A Novel Poly(vinyl alcohol)  
Polymer Membrane for Separation of Volatile Organic Compounds (VOCs).  
Thesis Advisors: Prof. Erdogan Gulari and Dr. Suwabun Chirachanchai, 42  
pp. ISBN 974-331-916-6

The PVA coupling with trimethylsilylchlorosulfonate (PVA-TMSCS) was successfully prepared in the presence of pyridine catalyst as observed by Si-O-S peak at  $1020\text{ cm}^{-1}$ . PVA and PVA-TMSCS were prepared as a membrane by using solvent casting method. The thickness of membranes of PVA and PVA-TMSCS are 0.017 and 0.021 mm as determined from interference fringe pattern by FTIR. The permeability studies on organic solvent vapors, i.e., benzene, cyclohexane, ethanol, methanol, and *iso*-propanol were quali/quantitatively analyzed by 3D-FTIR. The permeation rate of benzene and cyclohexane through PVA-TMSCS membrane is found to be 52 % and 28 % higher than through PVA membrane, respectively.

## ACKNOWLEDGEMENTS

The author would like to thank all professors who have tendered invaluable knowledge to him at the Petroleum and Petrochemical College, Chulalongkorn University. He would like to give a special thanks to his U.S. advisor, Prof. Erdogan Gulari who gave recommendations on the research. He is also deeply indebted to his advisor, Dr. Suwabun Chirachanchai, who not only originated this thesis work, but also gave him intensive suggestion, constructive advice and vital help throughout this research work.

He wishes to thank Dr. Sanong Ekasit, Department of Chemistry, Faculty of Science, Chulalongkorn University, who gave him precious advice and intensive suggestion in setting gas separation system. He specially thanks Prof. Koichi Kondo, Department of Chemistry, Faculty of Science and Engineering, Ritsumeikan University, Kyoto, Japan and Prof. Mitsuo Komatsu, Department of Chemistry, Faculty of Engineering, Osaka University, Osaka, Japan, for their instruction and suggestion in the modification of poly(vinyl alcohol).

In addition, he would like to thank the entire college members, staff, and all his best friends at the Petroleum and Petrochemical College.

Finally, the sincerest appreciation is extended to his family for the love, understanding, encouragement and financial support.

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